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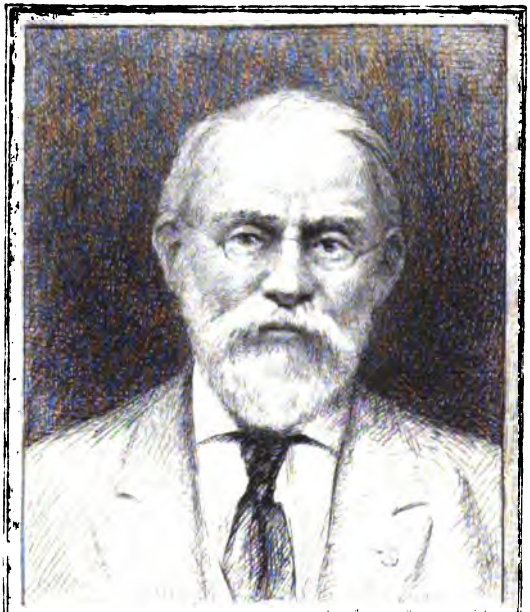

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TRANSACTIONS AND PROCEEDINGS

AND

REPORT

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XXIV., Part II.

[WITH THREE PLATES.]

EDITED BY PROFESSOR R. TATE.

ISSUED DECEMBER, 1900.

Adelaide:

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TRANSACTIONS

OF THE

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VOL. XXIV., Part I.

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Geological Notes on the Cliffs Separating Aldinga and Myponga Bays.

By Edward Vincent Clark, B.Sc.

[Communicated by Prof. Tate.]

[Read November 7, 1899.]

Travelling southwards along the coast from the Port Willunga Jetty, the Eocene and overlying Miocene both dip downwards, and after a mile or so the Eocene disappears beneath the sand strand; about half a mile further on the Miocene also reaches to sea-level. Both sets of beds are last seen as reefs between low and high water, but as the dip of the Miocene is the smaller, the reef formed by it is much larger than that of the Eocene, extending a considerable distance both seawards and southwards on the shore, and also a good deal further below sea-level. It is last seen about two miles from Port Willunga Jetty, but is visible somewhat further if the sand has been swept by a storm.

The Post-miocene clays which cap the cliffs then gradually give way to sandhills, which are well overgrown and contain a good percentage of calcic carbonate. The beach is broad, and above ordinary high tide is a bank of shingle, increasing in size as we go south, while the sandhills become smaller. Two miles (roughly) from where the Miocene reef disappears these are no longer covered with vegetation, and behind them is a lagoon in a basin that was formerly an arm of the sea, but which has been reclaimed by the shingle drifting up from the south and the sediment washed down from the Sellick's Ranges. This lagoon is now fresh water, or only slightly brackish when full, but dries up nearly every summer. Dead shells of *Coxiella confusa* are in profusion in the silt.

From this point the sandhills give place to a clayey deposit, still flanked by the bed of shingle (which is much coarser here), and rising somewhat rapidly in height—about one foot per chain. This clay bears a considerable likeness to the mottled clays overlying the Miocene at Blanche Point and the jetty, with the exception that it contains a vast amount of gravel, arranged in more or less horizontal layers. This gravel is mainly of quartzite, shale, and ironstone; and the pebbles are only slightly worn—most with the corners just taken off, but many quite angular, and a few well-rounded. Owing to the amount of gravel in this clay it will stand at a great inclination, and being by no means in

durated the wash of water has cut it into huge pinnacles, with sides nearly, if not quite, vertical. Where there happens to be little or no gravel, it stands at a much lower angle, and it is in such places that the resemblance is seen to the clays further north. This clay is well seen for upwards of two miles, and before losing its distinctive character, where the Cambrian limestones begin, attains a height of 150 feet or more. Beyond this the clays do not form the escarpment, and so are not prominent, being seen occasionally at the top of the cliffs. As the ground slopes almost without a break from the top of the escarpment to the Sellick's Ranges, these clays must be of immense volume.

Some five and a half miles south of the jetty—a mile south of where these clays first replace the sandhills—is seen a small patch of Eocene polyzoal limestone at their base. This bed is never visibly above 20 feet in height, and is about 600 yards long in all. It is largely worn away at the base, and owing to this its thinness and the weight of the overlying clays—here 80 to a 100 feet in height—it is greatly broken about. The result is that the dip of the bed is hard to estimate, but seems to be five to seven degrees to the south. That the dip is low is shown by the fact that a small extension of this bed as a reef presents a nearly flat surface, not a series of ridges, as is the case further south.

This limestone is of a distinct yellowish tinge, and very pure, over 90 per cent. being soluble in acid, the balance being clay, not sand. It is made up almost entirely of polyzoa, with a fair number of other fossils, but most in such fragments as to be unrecognisable, or at any rate not in a condition to be removed from the rock, which is extremely friable, crumbling under very little pressure. It is greatly undermined by the sea, which reaches it whenever the tide is higher than usual. The reef is, of course, much more indurated, or it could not exist.

For three-quarters of a mile further after the last of this limestone the clays form the escarpment, owing to their easy erosion somewhat back from the beach, and then Cambrian makes its appearance—mainly shale at first. The Cambrian strata here dip at an angle of 75° to the north-west, but the inclination is not well-shown, as, while the coast faces about west, the escarpment is irregular, sloping back from the beach, and somewhat overgrown; also devoid of distinct bands.

Up to this point the coast has run pretty consistently north and south, there being a slight bay from the Miocene reef southwards. Here it takes a sharp turn towards the west, and is henceforth very irregular. There is practically no more beach, the shore-line being either a reef or else piled up with detached boulders, with sometimes a few feet of sand interspersed with rocky debris at the foot of the escarpment.

Three hundred yards further on Eocene again appears overlying the Cambrian. It is here, however, much inclined, dipping to the N.N.W. at an angle of 50° at first, increasing to 65°, and finally diminishing to 45°. It extends seawards for a short distance as a reef, but owing to the high dip it is of no great breadth. Due, however, also to the great inclination, it is extremely regular, and for a 150 yards or so where the cliffs take a bend and run approximately parallel to the direction of strike (W.S.W.) it consists of a series of ridges, parallel to each other and to the shore. One ridge in particular, though only two feet wide, is so uniform that it was keeping the sea inside at a height of 15 to 18 inches higher than outside. In this the reef is very different to that at the small patch of Eocene rocks to the north, and to the reefs south of the Port Willunga Jetty and at Blanche Point. In these cases, where the dip of the rocks is low, the reef either presents a fairly level surface or, if the rock is not quite uniform, a labyrinthine outcrop, the projecting lines of greatest resistance to wear turning and twisting about extremely irregularly, as is so well seen in the Miocene reef at Schnapper Point, south of Port Willunga Jetty.

Opposite to these ridges the face of the cliff is peculiar; as it is approximately parallel to the line of strike, one would expect it to reveal the strata in horizontal bands, but, again owing to the high dip, every projection of a few feet causes a considerable depression in the position of the band on the face of the cliff, and in the same way every recession of a few feet causes a corresponding elevation. The result is that, seeing the escarpment here alone, one would go away with the impression that the strata were highly contorted.

These Eocene beds reach to a considerable height—at their southern extremity over a hundred feet; but are not so high further north.

The lithological character is considerably different from that of the bed before mentioned (though containing pretty much the same fossils), and approaches more nearly to that of the Eocene to the south of the Port Willunga Jetty. The rock is not nearly so full of polyzoa, and yields only 60-70 per cent. soluble in acid, the balance being partly sand, partly clay. It is also more indurated, in places being very hard. Here again fossil collecting is of very little use, everything being broken, and obtainable in fragments only.

After being absent from the face of the cliff for about three-quarters of a mile, the Cambrian again is seen at the foot of the escarpment beneath the Eocene, which extend for about a 100 yards further, their last appearance in the cliff being at an altitude of over a 100 feet. The Eocene reef extends for perhaps a

150 yards more, but after that, as far as I was able to go (about four miles measured along the coast, though much less as the crow flies) no more was visible

The cliffs here, at the end of the Eocene, are of great height, but it is hard to say exactly what. The top of the escarpment is not well defined, and from there the ground slopes directly up to the Sellick's Ranges. Quite close to the cliff, though not right at its edge, I was at an elevation of a 180 feet.

The Cambrian near here dips at an angle of 65° to 70° to the north, the westerly strike being very clearly shown by the bands of quartzite standing out on a small reef at the foot of the escarpment. This reef protects the cliff from the sea's action, and therefore there is here very little loose rock on the shore-line, and the high-water mark is shown by a line of sand some 20 feet wide. Further south the inclination is greater, but still in the same direction. Here the rocks dip at an angle of 75° at the top of the escarpment (here a 100 feet high), and at the base they are vertical or even slightly inclined in the opposite direction, though but a very small part shows this inversion. A little further still the dip is 80°, and strike (as shown by the reef on the beach) W. by S. This reef extends very little further—less than three-quarters of a mile altogether—and after that the beach, or rather the shore-line, presents a tangled mass of boulders. These are some of quartzite, well-rounded, and very smooth; some of a calcareous nature, worn into sharp spikes and projections, painful to walk on; and others, which present the most peculiar appearance, composed of black ferruginous dolomite, which wears away along the lines of stratification into amygdaloidal holes, into which pebbles have often been forced, and too coarse to be seen in hand specimens. This rock does not appear on the face of the cliff, but is very plentiful on the shore-line, not only along here, but also right back to where the Cambrian first appears. Masses of ironstone are also to be met with occasionally.

After the end of the Cambrian reef the cliffs are not nearly so fine, seldom presenting a bold escarpment to the sea, but sloping back somewhat, with frequently a surface coating of clayey soil carrying vegetation. The rock itself, which crops out frequently, also becomes more calcareous in nature. The dip is, therefore, hard to obtain, as even where a fair section is shown there is no reef to show the strike, which is highly important with such a great dip. Occasionally, where the cliff slopes back more than usual, the shore-line becomes more pebbly, with fewer great boulders; and in a few spots a small patch of sand was to be met with. Also, at intervals, there is a jutting point of rock extending right up to the sea, making it difficult to pass, and this appeared to be more frequently the case towards Myponga.

The cliffs here, as mentioned above, are more calcareous than further north (especially the jutting points), where they are mostly pink, purple, brown, or black shales, with bands of quartzite, highly coloured by iron. It is by these quartzite bands that the dip is most apparent, the shales showing stratification lines very poorly.

The following are the distances of the various distinctive points of the coast from the Port Willunga Jetty, as measured by cyclometer :—

	Distance S. of Port Willunga Jetty.	
End of Miocene reef	(say) 2 miles	
End of thickly-clothed sandhills ...	4 "	
Beginning of gravelly clays	$4\frac{1}{2}$ "	
Appearance of Eocene rocks ...	$5\frac{1}{2}$ "	
Disappearance of Eocene rocks ...	$5\frac{7}{8}$ "	
Appearance of Cambrian	$6\frac{5}{8}$ "	
Disappearance of Cambrian and reappearance of Eocene (here highly inclined)	$6\frac{3}{4}$ "	Estimated only.
Reappearance of Cambrian	$7\frac{1}{2}$ "	
Final disappearance of Eocene ...	$7\frac{5}{8}$ "	
End of Cambrian reef	$8\frac{1}{4}$ "	

As mentioned before, fossils are very difficult to collect, owing to their being nearly all in fragments. The following, however, I have identified :—

From the first Eocene bed (of low inclination)—

Cidaris sp.
Lovenia Forbesii, *Ten.-Woods.*
Scutellina patella, *Tate.*
Fibularia gregata, *Tate.*
Antedon pertusa, *Tate*, m.s.
Waldheimia sp. (indet.).

From the second Eocene bed (of high inclination)—

Cidaris sp.
Echinus Woodsii, *Laube.*
Lovenia Forbesii, *Ten.-Woods.*
Fibularia gregata, *Tate.*
Echinolampas posterocrassus, *Gregory.*
Pecten consobrinus, *Tate.*
Waldheimia sp. (indet.).

NEW MICRO-LEPIDOPTERA—MOSTLY FROM QUEENSLAND.

By A. JEFFERIS TURNER, M.D., F.E.S., Brisbane.

[Read December 5, 1899.]

XYLORYCTIDÆ.

This family is now merged by Mr. Meyrick in the *Gelechiadæ*, but as the Australian *Gelechiadæ*, with the exception of this section, have not yet received systematic treatment, it is convenient to retain the above designation for the present. The present contribution is supplementary to my paper on the "Queensland *Xyloryctidæ*," in the Annals of the Queensland Museum, No. 4, 1897.

PILOSTIBES, *Meyr.*

Forewings with veins 7 and 8 stalked or coincident, 7 to costa.

On reconsideration, I have determined to retain this genus, altering the definition as above, and regarding *P. enchidias*, Meyr., as the type; referring *P. stigmatias*, Meyr., to *Xylorycta*.

PILOSTIBES TRACHYPTERA, *n. sp.*

Female, 40 mm. Head brown-whitish. Palpi brown-whitish; terminal joint and apex of second joint white. Antennæ grey. Thorax brown-whitish. Abdomen whitish. Legs brown-whitish; anterior tibiæ and tarsi much thickened with scales. Forewings posteriorly dilated, costa rather strongly arched, apex round-pointed, hindmargin straight, slightly oblique; veins 7 and 8 coincident; brown-whitish, suffused with reddish-brown and fuscous-brown, with five or six tufts of raised scales; a dark-fuscous oblique mark on costa at one-fourth; paler fuscous marks on costa at middle, three-fourths, and two more between last and apex; an ill-defined blackish streak in disc above middle, and several fine blackish streaks along veins in posterior portion of disc; cilia brown-whitish, with an incomplete darker basal line. Hindwings brown-whitish; cilia whitish, at apex pale fuscous.

A very distinct species, apparently referable here, but the male is wanted to establish this with certainty. The raised tufts of scales on forewings are a peculiar character.

Palmwoods, Queensland (60 miles north of Brisbane); one specimen taken by Mr. R. H. Relton.

Cryptophaga balteata, *Walk.*

Male. *Zitna balteata*, Walk., Suppl., 1841.

Female. *Cryptophaga lurida*, Meyr., Proc. Roy. Soc., S.A., 1890, p. 37.

Both sexes *Cryptophaga acroleuca*, Turner, Annals Queensland Museum, 1897, p. 8.

I am indebted to Mr. Meyrick for this synonymy.

Cryptophaga opalina, *n. sp.*

Antennal pectinations in male extremely short (one-half), cilia in tufts from pectinations. Veins 6 and 7 of hindwings separate, but closely approximated at base.

Male, 29 mm. Head white. Palpi white; base of second joint fuscous externally. Antennæ dark-fuscous, with a few scattered whitish scales; basal joint white. Thorax white, with a few scattered dark-fuscous scales in patagia, and a large posterior dark-fuscous spot with purple reflections. Abdomen whitish; bases of segments partly ochreous-brown. Legs white; anterior and middle tibiæ and tarsi dark-fuscous, annulated with white. Forewings elongate-oblong, costa slightly arched, apex rounded, hindmargin scarcely oblique, rounded beneath; white; a moderately broad fascia from costa near base, narrowing to inner-margin at one-fourth, produced along costa to base, near costa grey, thence dark-fuscous with purple reflections; an incomplete interrupted line posterior and parallel to this, dark-fuscous with purple reflections; a large fascia from costa before middle, much dilated in disc and on inner-margin, on costa and on posterior margin grey, the remainder a medley of dark-fuscous with purple reflections, ochreous-brown, and white scales; a broad grey line parallel to hindmargin; separted by a fine white line from a broad grey line on margin; cilia dark-fuscous, with a narrow basal white line, at anal angle wholly white. Hindwings grey; towards inner-margin whitish; cilia white, with a basal grey line along anterior half of hindmargin and around apex.

A very distinct and highly beautiful species. The extremely short antennal pectinations render it difficult to distinguish from *Lichenaula*.

Brisbane, Queensland; one specimen at light in November.

Xylorycta assimilis, *n. sp.*

Female, 26 mm. Head white, side tufts and face ochreous-tinged. Palpi whitish ochreous; second joint with a few dark-fuscous scales; terminal joint whitish. Antennæ whitish-ochreous, annulated with dark-fuscous; base of first joint dark-fuscous on upper surface. Thorax white, anteriorly

ochreous tinged. Abdomen whitish-ochreous. Legs ochreous; anterior pair infuscated. Forewings elongate-oblong, costa moderately arched, apex round-pointed, hindmargin straight, oblique; snow-white; costal edge pale-ochreous throughout; a faint ochreous suffusion at anal angle; cilia wholly pale-ochreous. Hindwings whitish-ochreous; apical portion of disc greyish-tinged; cilia pale-ochreous.

This resembles and might be mistaken for *Neodrepta (Xylorycta) luteotactella*, Walk., but may be at once distinguished by the neuration, vein 8 of forewings running to costa, and not to hindmargin, as in that species. It also differs in the absence of orange coloration of face and palpi, and in the ochreous hindwings.

Sydney, New South Wales; one specimen taken in October by Mr. G. Lyell. The type is in his collection.

XYLORYCTA ACROCHROA, *n. sp.*

Female, 20 mm. Head and thorax snow-white. Palpi white. Antennæ whitish-ochreous; basal joint white. Abdomen whitish. Legs whitish-ochreous; posterior tibiæ and tarsi white. Forewings elongate-oblong, costa slightly arched, apex round-pointed, hindmargin straight, oblique; snow-white; a narrow ochreous streak along costa from before middle to three-fourths, slightly broader towards apex, where it ends in a short, very oblique fuscous streak; a small triangular orange-ochreous spot on costa just before apex, bounded beneath by a fuscous line; cilia snow-white, at apex tipped with fuscous, and with a dark-fuscous bar at one-third. Hindwings whitish grey; cilia white.

Conspicuously distinct among the species with white forewings by the apical markings.

Mount Tambourine (1,800 feet), Queensland; one specimen in November.

ZAUCLOPHORA, *n. g.*

Head smooth. Tongue moderate. Antennæ moderate, in male shortly bipectinated throughout, basal joint moderate without pecten. Labial palpi very long, recurved ascending, second joint much exceeding base of antennæ, terminal joint shorter than second, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Anterior and middle tibiæ smooth-scaled, posterior tibiæ rough-haired. Forewing with vein 2 from two-thirds, 7 and 8 stalked, 7 to hindmargin, 8 to apex, 11 from middle. Hindwings over 1, veins 3 and 4 short-stalked, 5 parallel, 6 and 7 approximated at base.

A development of *Lichenaula*, from which it is distinguished by the pectinated antennæ of the male. From *Cryptophaga* it differs in the much longer palpi, more slender abdomen, and smoother anterior and middle tibiæ.

ZAUCLOPHORA PELODES, *n. sp.*

Male, 23 mm. Head and thorax ochreous-brown. Palpi dark-fuscous; posterior aspect whitish-ochreous. Antennæ dark-fuscous. Abdomen reddish-ochreous; apices of segments whitish-ochreous. Legs whitish-ochreous; first two pairs dark-fuscous anteriorly. Forewings elongate, costa moderately arched, apex rounded, hindmargin slightly rounded, oblique; ochreous-brown, with ill-defined ochreous-whitish markings; an ochreous-whitish suffusion in disc; an outwardly curved line from costa at two-thirds to anal angle; two ochreous-whitish spots at and before apex, separated by a fuscous spot; hindmargin and anal angle irrorated by fuscous scales; cilia ochreous-whitish, irrorated with fuscous. Hindwings fuscous; towards base suffused with ochreous; cilia whitish-ochreous, with a faint fuscous line at apex and at anal angle.

The type is in poor condition, but the species is a very distinct one.

Brisbane, Queensland; one specimen received from Mr. H. Tryon.

LICHENAULA AMBLYGONA, *n. sp.*

Female, 28 mm. Vein 7 of forewings to hindmargin. Head white. Palpi white; terminal joint mostly fuscous internally. Thorax fuscous, irrorated with white scales. Abdomen ochreous-fuscous. Legs whitish, irrorated with fuscous, except posterior tibiæ. Forewings dilated posteriorly, costa strongly arched, apex round-pointed, hindmargin sinuate; white rather densely irrorated with fuscous; a triangular fuscous suffusion on inner-margin before middle; a short longitudinal suffused mark in disc before middle; a very distinct outwardly oblique line from costa at two-thirds, angulated in disc, and continued parallel to hindmargin to inner margin at three-fifths; an indistinct suffusion on middle of hindmargin; cilia fuscous, at apex white, at anal angle with white apices. Hindwings pale-grey, towards base whitish; cilia grey.

Distinguished from the other species with an angulated posterior line—*L. oxygona*, Luc.; *L. goniodes*, Turn., and *L. micradelpha*, Turn., by the fuscous thorax.

Brisbane, Queensland; one specimen taken by Mr. F. P. Dodd. I am indebted to Lord Walsingham for permission to describe this species, of which the type is now in his collection.

LICHENAULA INSCRIPTA, *Turn.*

Annals Queensland Mus., 1897, No. 4, 21.

Male, 19 mm. Head and thorax white. Palpi white, apex of second joint slightly fuscous-tinged. Antennæ dark-fuscous. Abdomen fuscous; first two rings and apices of segments white;

tuft ochreous-whitish. Legs whitish; anterior pair fuscous. Forewings elongate, costa moderately arched, apex rounded, hindmargin sinuate, moderately oblique; white; markings fuscous; costal edge dark-fuscous towards base, thence ochreous-tinged; a dot on fold at two-fifths; two small dots placed transversely in disc at two-thirds, an outwardly oblique line from costa at two-thirds, narrowing in disc, abruptly bent, and continued suffusedly to anal angle; three dots on apical third of costa; a suffused hindmarginal line, leaving hindmarginal edge white; five or six fine blackish lines, parallel to veins, running into hindmargin; cilia fuscous, darker at apex, with an indistinct whitish median line. Hindwings grey, towards base and at apex whitish; cilia whitish.

Female, 26 mm. Abdomen wholly whitish. Forewings with angulated line replaced by a broad fuscous suffusion, prolonged along fold towards base, its posterior edge sharply defined.

Differs from *L. oxygona*, Luc., by the ground colour not being greyish, and by the numerous longitudinal blackish lines running into hindmargin; also by the dot on fold. Its place in my tabulation should be altered accordingly.

The type was wasted. I have since taken a very perfect male on Mount Tambourine (1,800 ft.), Queensland, in November, and have recived a female taken at Brisbane from Mr. H. Tryon.

Lichenaula tholodes, *n. sp.*

Female, 18-21 mm. Head, thorax, and palpi purplish-fuscous, irrorated with whitish; internal surface of palpi mainly whitish. Antennæ dark-fuscous. Abdomen grey; tuft whitish. Legs whitish; anterior femora, and anterior and middle tibiæ dark-fuscous, irrorated with whitish: anterior tarsi dark-fuscous, with whitish annulations. Forewings oblong, costa moderately arched at base, thence nearly straight, apex rectangular, hindmargin slightly sinuate, scarcely oblique; purplish-fuscous, densely irrorated with whitish, less so along a line from base to anal angle; cilia fuscous. Hindwings with hindmargin sinuate beneath apex; grey; cilia pale-grey, with a darker basal line.

Allied to *L. ignota*, Turn., from which it differs in the purplish-fuscous colouring and absence of markings.

Brisbane, Queensland; two specimens taken at light in January and March.

Maroga mythica, *Meyr.*

Maroga undosa, Lucas, Proc. Linn. Soc., N.S.W., 1893, p. 164.

I sent a specimen of Lucas' species to Mr. Meyrick, who informs me that it is identical with his own.

Eschatura lemurias, *Meyr.*

Meyrick, Trans. Ent. Soc., 1897, p. 382.

Phlœophora codonoptera, Turner, Annals Queensland Museum, 1897, p. 23.

Mr. Meyrick's name has a few weeks' priority. Whether my *Phlœophora lactea* is referable to the same genus must be left undecided until the male is discovered.

Procometis hylonoma, *Meyr.*

Procometis acompta, Turn. Annals Queensland Museum, No. IV., p. 30, and *Procometis heterogama*, Lower, Proc. Linn. Soc., N.S.W., 1899, p. 103, are identical with this species.

Brisbane, Stradbrooke Island, and Warwick, Queensland; Broken Hill, New South Wales. Probably, therefore, a species of very wide distribution. Meyrick records it from Sydney and Bathurst, New South Wales; and Kangaroo Island, South Australia.

Agriophara nodigera, *n. sp.*

Female, 18 mm. Head, thorax, palpi, and antennæ ochreous-whitish, irrorated with fuscous. Palpi very short, not reaching halfway to base of antennæ, terminal joint minute. Abdomen ochreous-fuscous. Legs whitish, sparsely irrorated with fuscous; tarsi and anterior tibiæ annulated with fuscous. Forewings elongate-oval, costa moderately arched, apex rounded, hindmargin very obliquely rounded; whitish, densely irrorated with dark-fuscous, with roundish raised tufts of blackish scales; three in a line from beneath costa at one-sixth to above inner-margin at one-third; three or four in an oblique line from costa at one-third to above middle of inner-margin; just outside this is an ochreous-brown spot in disc before middle; a more obscure curved line of raised dots from costa at one-half to above and before anal angle; just beyond this is an ochreous-brown spot in disc at two-thirds; a very obscure series of dots parallel to hindmargin, not raised; cilia fuscous, with a few whitish scales, and a darker line at one-third. Hindwings fuscous-grey; cilia grey, with a darker line at one-third.

I do not think it necessary to remove this species from *Agriophara*, with which it agrees in neuration, but the peculiar palpi constitute a new section of this genus. The markings are obscure, but the raised blackish dots are characteristic.

Warwick, Queensland; one specimen in October.

ŒCOPHORIDÆ.

The genera here treated of belong to the section of the family without male antennal ciliations, formerly regarded as a separate family, under the name of *Depressariadæ*.

PEDOIS, *Meyr.* (MSS.).

Head with appressed scales, side tufts forming a cone-like projection over face. Antennæ in male simple, pecten absent. Palpi long, second joint exceeding base of antennæ, terminal joint shorter than second, slender, acute. Forewings elongate-oblong, 1 b furcate at base, from junction branching again, lower branch terminating abruptly before reaching margin, 2 and 3 from before anal angle, 6 to apex or costa, 7 and 8 stalked, 7 to costa. Hindwings 1 or slightly over 1, veins 3 and 4 connate, 6 and 7 parallel. Posterior tibiæ long-haired.

I have representatives of six species, which may be tabulated thus—

1.	Vein 6 to costa	2.
	Vein 6 to apex	3.
2.	Forewings with long streaks parallel to veins ...	*tripunctella*, Walk.
	Forewings without long streaks parallel to veins	*cosmopoda*, n. sp.
3.	Second joint of palpi with a minute posterior tuft before apex	*neurosticha*, Lower
	Second joint of palpi without a minute posterior tuft before apex	4.
4.	Hindwings yellow	*eurnorpha*, Meyr.
	Hindwings not yellow	5.
5.	Forewings orange-ochreous	*humerana*, Walk.
	Forewings reddish	*rhodomita*, n. sp.

PEDOIS HUMERANA, *Walk.*

Armidale (3,500 ft.) and Tenterfield (3,000 ft.), New South Wales, in February.

PEDOIS EURNORPHA, *Meyr.* (MSS.).

Armidale (3,500 ft.), New South Wales, in October.

PEDOIS NEUROSTICHA, *Lower.*

Proc. Roy. Soc., S.A., 1894, p. 112.

Gisborne, Victoria, in January; two specimens received from Mr. S. Lyell.

PEDOIS TRIPUNCTELLA, *Walk.*

Brisbane, Queensland, in August and September.

PEDOIS COSMOPODA, *n. sp.*

Male and female, 16-18 mm. Head and thorax grey, irrorated with whitish-grey; face whitish. Palpi whitish; second joint with a dark-fuscous subapical ring, and dark-fuscous basal and medium bars on external surface; terminal joint dark-fuscous anteriorly, posteriorly pinkish-tinged. Antennæ whitish, pinkish-tinged, annulated with dark-fuscous. Abdomen whitish-grey. Legs whitish; anterior and middle tibiæ pinkish, annulated with dark-fuscous. Forewings elongate-oblong, costa strongly arched

at base, thence straight, apex rounded, hindmargin very obliquely rounded; whitish-grey irrorated with dark-fuscous; costal edge pink from base to apex; the irroration is particularly dense along inner-marginal portion of disc, and in posterior portion of disc shows a tendency to form short streaks parallel to veins; cilia whitish, faintly pinkish-tinged, with traces of a medium fuscous line. Hindwings grey, paler towards base; cilia grey.

Closely allied to *P. tripunctella*, Walk, from which it differs in the absence of long discal streaks and the well-marked pink colour of costa and legs.

Sandgate and Wynum, near Brisbane, Queensland; four specimens in August.

PEDOIS RHODOMITA, *n. sp.*

Male, 19 mm. Head whitish, suffused with vinous-red. Palpi whitish; second joint externally suffused with dark-fuscous; terminal joint reddish-tinged; anterior and internal surface dark-fuscous, except at base and apex. Antennæ reddish, with fine blackish annulations, beneath whitish. Thorax whitish-ochreous, reddish-tinged. Abdomen whitish. Legs whitish; anterior pair reddish-tinged. Forewings elongate-oblong, costa strongly arched at base, thence nearly straight, apex rounded, hindmargin obliquely rounded; whitish, irrorated with reddish scales, which form numerous confused longitudinal streaks, a reddish-fuscous dot in disc before middle, a second beyond middle, and a third on fold beneath first; a series of reddish-fuscous dots on apical third of costa and hindmargin; cilia reddish. Hindwings grey, cilia whitish.

Allied to *P. neurosticha*, Lower; very distinct by the reddish colouring.

Mt. Tambourine, Queensland; one specimen taken in January by Mr. C. J. Wild.

PERITORNENTA, *Meyr.* (MSS.).

Head with appressed scales. Palpi long, second joint much exceeding base of antennæ, terminal joint shorter than second, rather stout, acute. Antennæ as long, or nearly as long, as forewings; in male simple, pecten absent. Forewings oblong, with much-rounded apex; 1 b furcate at base, 2 from close before angle, 6 and 7 stalked, 7 to apex. Hindwings 1, veins 3 and 4 stalked, 7 widely separate from 6 at base, somewhat approximated in disc, then slightly diverging.

I have three species referable here—

1. Hindwings ochreous ... ... *cerculatella*, Walk.
   Hindwings not ochreous ... ... 2.
2. Forewings with a series of blackish dots from base to costa at beyond middle ... ... *stigmatias*, n. sp.
   Forewings without a series of blackish dots from base to costa at beyond middle ... ... *thyellia*, Meyr.

PERITORNENTA CIRCULATELLA, *Walk.*

Brisbane, Queensland, in October.

PERITORNENTA THYELLIA, *Meyr.* (MSS.).

Brisbane, Queensland.

PERITORNENTA STIGMATIAS, *n. sp.*

Male, 17-19 mm. Head and thorax pale-fuscous; face whitish. Palpi whitish; terminal joint pale-fuscous, except on internal surface. Antennæ whitish. Abdomen ochreous-whitish. Legs whitish; anterior tibiæ and tarsi pale-fuscous. Forewings elongate-oblong, costa strongly arched at base, thence nearly straight, apex obtusely rounded, hindmargin rounded, scarcely oblique; pale-fuscous, with numerous dark-fuscous dots arranged in rows on veins; a line of dots from base to costa beyond middle; a second row from base to inner-margin beyond middle; eight rows in posterior portion of disc; cilia whitish. Hindwings grey, towards base whitish; cilia whitish.

Brisbane and Mt. Tambourine, Queensland; two specimens in November and January.

SCORPIOPSIS SUPERBA, *Turn.*

Proc. Roy. Soc., S.A., 1894, p. 133.

I have seen a second specimen of this species taken by Mr. C. J. Wild on Mount Tambourine, Queensland, in February, and now in the Queensland Museum.

PLUTELLIDÆ.

ENÆMIA DIVES, *Walk.*

Lactura dives, Walk., Bomb, 486. *Calligenia pilcheri*, Lucas, Proc. Linn. Soc., N.S.W., 1891, p. 279.

Rockhampton, Bundaberg, and Brisbane, Queensland.

ENÆMIA MIXOLEUCA, *n. sp.*

Female, 18-19 mm. Head white. Palpi dark-fuscous; terminal joint white. Antennæ grey; towards apex whitish-grey. Thorax dark-fuscous; apex of patagia and a large posterior spot white. Abdomen reddish-orange, beneath whitish. Legs whitish; anterior pair dark-fuscous; posterior tibiæ reddish-orange. Forewings elongate, posteriorly dilated, costa moderately arched, apex rounded, hindmargin obliquely rounded; white; markings dark-fuscous; a broad streak along costa from base to one-fifth; a fascia from middle of costa, much widened in disc and on inner-margin, where it extends from one-fourth to three-fourths, and includes a sinuate white bar, widest on margin, followed by a variably developed white dot; anterior edge of fascia strongly sinuate, and connected with costa streak; a second fascia from

costa before apex to anal angle, moderately broad, inwardly curved, and enclosing a small white dot in disc; three dots on hindmargin beneath apex, tending to coalesce, and to be connected with second fascia; cilia white, on markings dark-fuscous. Hindwings reddish-orange, with an apical fuscous blotch; cilia on apical portion fuscous, with a darker line at one-third, towards anal angle reddish-orange.

Gympie, Queensland; three specimens taken by Mr. R. Illidge.

CALLITHAUMA, *n. g.*

Head with appressed scales, slightly projecting anteriorly. Palpi long; second joint exceeding base of antennæ, smooth scaled, somewhat thickened towards apex; terminal joint much shorter than second, slender, acute. Antennæ in male simple, pecten absent. Thorax smooth. Forewings rather narrow, 1 b furcate at base, 2 from four-fifths, 7 and 8 stalked, 7 to apex. Hindwings under 1, cilia two-thirds, veins 3 and 4 connate, 6 and 7 parallel. Posterior tibiæ smooth-scaled. Male genitalia provided with a pair of long curved processes, arising from inferior surface and projecting upwards.

CALLITHAUMA BASILICA, *n. sp.*

Male and Female, 12-13 mm. Head yellow, mixed with reddish on crown. Palpi orange; terminal joint whitish, with a broad subapical dark-fuscous ring. Antennæ whitish, annulated with blackish; base of first joint reddish. Thorax reddish, mixed with pale yellow. Abdomen grey. Legs whitish; anterior tibiæ reddish. Forewings narrow elongate, costa moderately arched, apex rounded, hindmargin very obliquely rounded; bright-red, mixed with purple-fuscous, markings clear yellow, edges of markings mostly clear red; an oblique bar from base of costa; a moderate fascia from costa at one-fourth to inner margin before middle, broadest on costa, somewhat curved in disc; a dot on inner-margin beyond middle, a second dot in disc external to this—these show a variable tendency to connection with a narrow fuscous-edged fascia from costa beyond middle to anal angle; a triangular spot on costa at four-fifths; cilia yellow, at anal angle mixed with red. Hindwings whitish; cilia ochreous-whitish.

Toowoomba and Killarney, Queensland; five specimens in September and October.

PSEUDOTORTRIX, *n. g.*

Head with appressed scales, side tufts rather small. Palpi short, recurved, not reaching base of antennæ; second joint stout, with appressed scales; terminal joint very short, rather

stout, pointed. Antennæ short (half), in male with short ciliations (half), pecten absent. Thorax smooth. Abdomen stout. Forewings posteriorly dilated, apex rectangular, hindmargin not oblique; vein 1 b furcate at base, 2 from near angle of cell, 7 and 8 stalked, 8 to hindmargin, 11 anastomosing with 12. Hindwings over 1; vein 2 from angle of cell, 6 and 7 stalked. Posterior tibiæ smooth-scaled.

I am indebted to Mr. Meyrick for indicating the correct position of the following species, which superficially has a close resemblance to some of the *Tortricidæ*.

PSEUDOTORTRIX ACOSMA, *n. sp.*

Male and female, 16-17 mm. Head and thorax brownish-fuscous. Palpi brownish-fuscous, internal surface of second joint white. Antennæ whitish-ochreous, sometimes fuscous. Abdomen dark-fuscous or brownish-fuscous. Legs whitish. Forewings posteriorly strongly dilated, costa moderately arched, apex rectangular, hindmargin very slightly sinuate, rounded beneath, not oblique; brownish-fuscous, posterior portion of disc sometimes suffused with brownish-ochreous; sometimes a small fuscous erect line on inner-margin at one-fifth; a very irregularly angled fuscous line from costa before middle to inner-margin beyond middle; a fuscous dot in disc at two-thirds; followed by two oblique fuscous lines from costa at three-fifths and four-fifths towards, but not reaching, anal angle and hindmargin respectively—all these markings may be obsolete; sometimes a dark-fuscous line close to upper three-fourths of hindmargin; cilia dark-fuscous, at anal angle paler. Hindwings fuscous-grey; cilia grey, towards apex with a darker line at one-third.

Brisbane, Queensland; from January to May six specimens. I have also a female specimen measuring 20 mm., with forewings suffused with pale-ochreous and without markings, taken near the Jenolan Caves, New South Wales, which may belong to the same species.

TINEIDÆ.

NEMOPHORA, *Hübner.*

This genus has not hitherto been recorded outside Europe, and I was in some doubt as to whether the first species here recorded should be referred to it, as in my solitary specimen the face is damaged and palpi broken. In a second closely allied species received from Mr. G. Lyell these parts are perfect.

NEMOPHORA LEPTOSTICTA, *n. sp.*

Male, 13 mm. Head, thorax, and abdomen pale-grey. Antennæ over three, white. Legs whitish. Forewings posteriorly dilated, costa slightly arched, apex round-pointed,

hindmargin very obliquely rounded; white, with numerous pale-grey dots tending to form interrupted transverse strigulæ; cilia white. Hindwings whitish-grey; cilia white.

Ballandean (2,500 ft.), Queensland; one specimen in February.

NEMOPHORA IOLAMPRA, *n. sp.*

Female, 16 mm. Head, thorax, palpi, and antennæ fuscous. Antennæ over two. Abdomen grey. Legs pale-fuscous; posterior pair whitish. Forewings narrow-elongate, not dilated, costa slightly arched, apex round-pointed, hindmargin very obliquely rounded; pale-grey, with violet reflections; irrorated with fuscous scales, which tend to form transverse strigulæ; cilia whitish-grey. Hindwings and cilia whitish-grey.

Gisborne, Victoria; one specimen taken by Mr. G. Lyell in May.

ZONOPS, *n. g.*

Head and face densely rough-haired. Eyes in male divided by a horizontal ridge of scales into upper and lower segments; lower segments greatly enlarged, closely approximated beneath. Tongue short. Antennæ very long in both sexes, about twice forewings, in male filiform, simple, basal joint with pecten present. Labial palpi moderate, second joint slender, with appressed scales; terminal joint about one-half second, slender, acute. Maxillary palpi absent. Posterior tibiæ rough-haired. Forewings with vein 1 furcate, 2 from near angle, 7 and 8 stalked, 7 to costa, 11 from before middle. Hindwings over 1, veins 3 and 4 connate, 5, 6, and 7 equidistant, parallel.

The structure of the eyes in the male is very remarkable. The horizontal ridge of scales apparently serves to divide the field of vision of each eye into an upper and a lower part.

ZONOPS HETEROLEUCA, *n. sp.*

Male and female, 15-16 mm. Head, face, palpi, and antennæ dark-fuscous; fillet and bases of antennæ whitish in female. Thorax dark-fuscous, patagia pale-fuscous; in female wholly pale-fuscous. Abdomen fuscous; tuft in male white. Legs dark-fuscous, annulated with whitish; posterior pair whitish-fuscous. Forewings narrow-elongate, costa slightly arched, apex round-pointed, hindmargin obliquely rounded; dark-fuscous, with a suffused whitish-grey line along fold, replaced in female by an oblong spot occupying basal two-fifths of inner-margin; a snow-white blotch on costa from three-fourths to apex, containing a few dark scales, its anterior angle connected with a small white spot in disc; in female the apical blotch is prolonged anterior beneath costa as far as disc at one-third; cilia whitish, mixed with pale-fuscous, with a dark-fuscous line at one-third. Hind-

wings two, sinuate beneath apex; dark-fuscous, in female grey; cilia grey, with a dark-fuscous line at one-third.

Brisbane, Queensland; two specimens.

XYSMATODONA POLYMERES, *n. sp.*

Male, 16 mm. Head ochreous-whitish. Palpi dark fuscous. Antennæ dark-fuscous; basal joint ochreous-whitish. Thorax dark-fuscous. Abdomen grey; tuft ochreous-whitish. Legs whitish; antorior pair dark-fuscous, with obscure whitish annulations. Forewings elongate-triangular, costa slightly arched, apex round-pointed, hindmargin obliquely rounded; vein 7 absent; white; markings dark-fuscous; a narrow basal fascia prolonged along costa to one-sixth; an erect spot on inner-margin at one fourth; a moderately broad fascia from costa at one-fourth to before middle of inner-margin, its anterior edge very irregular, deeply excavated in middle; a rather large triangular spot on costa beyond middle, its lower angle nearly meeting a narrow erect spot on anal angle; a triangular spot on costa before apex; several small spots on hindmargin partly confluent; besides these markings there are a few scattered fuscous scales, and the species is probably variable; cilia whitish, faintly ochreous-tinged, on spots bases are fuscous. Hindwings very pale-whitish-grey; cilia whitish.

It appears to resemble *X. hamalitha*, Meyr., but may be distinguished by the wholly pale hindwings.

Brisbane, Queensland; one specimen in July.

XYSMATODONA LENCERES, *n. sp.*

Female, 18 mm. Head, thorax, palpi, and antennæ white. Abdomen whitish-grey; tuft whitish. Legs whitish-grey; posterior pair whitish. Forewings elongate, costa moderately arched, apex acute, hindmargin very obliquely rounded; 7 and 8 stalked; white, with scattered whitish-grey scales, tending to form transverse strigulæ; cilia white. Hindwings very pale-whitish-grey; cilia white.

Closely allied to *X. pelochra*, Meyr., differing in its white colour. From *X. nephelodes*, Meyr., it may be distinguished by the neuration.

Brisbane, Queensland; one specimen in October.

XYSMATODONA PELOCHRA, *Meyr.*

The female is considerably paler in colour than the male, but otherwise similar.

ARDIOSTERES SCOTEINA, *n. sp.*

Male, 22 mm. Head dark-fuscous. Palpi ochreous, mixed with dark ciliations; fuscous, except towards base and at apex

Antennæ dark-fuscous. Thorax with a large posterior crest; dark-fuscous; apex of patagia and two postero-lateral spots pale-ochreous. Abdomen dark-fuscous; beneath ochreous; tuft large, ochreous-whitish. Legs dark-fuscous, mixed with ochreous. Forewings moderate, posteriorly somewhat dilated, costa rather strongly arched, apex round-pointed, hindmargin obliquely rounded; dark-fuscous, with purplish iridescence; some pale-ochreous scales near base; a pale-ochreous linear mark on costa at two-thirds, with a similar smaller dot beyond it; a whitish erect mark from inner-margin before middle, curving outwardly in disc; a whitish spot on margin before anal angle; a whitish dot above anal angle, and two or three close to hindmargin above middle; cilia dark-fuscous, with a whitish spot just below middle of hindmargin. Hindwings and cilia dark-fuscous.

Mt. Tambourine (1,800 ft.), Queensland; one specimen taken by Mr. Illidge in February.

CHRYSORYCTIS OCHROXANTHA, *n. sp.*

Female, 15 mm. Head pale-yellowish. Maxillary palpi dark-fuscous. Labial palpi dark-fuscous; internal surface whitish. Antennæ dark fuscous. Thorax dark-fuscous, with a small yellowish posterior spot. Abdomen fuscous. Legs pale-ochreous; anterior and middle tibiæ and tarsi dark-fuscous. Forewings elongate, costa moderately arched, apex rounded, hindmargin very obliquely rounded; pale-yellowish; a well-marked dark-fuscous streak along costa nearly to middle, at base reaching inner-margin; a pale-iridescent-purple fascia from costa at three-fourths, broadening beneath, bounded anteriorly by a fine fuscous, nearly straight line to inner-margin at two-thirds, posteriorly ill-defined, and reaching to lower part of hindmargin; included in middle of fascia is a small oval yellowish spot, placed transversely, and edged by fuscous scales; a short broad dark-fuscous streak beneath apex, extending through cilia; some ill-defined hindmarginal fuscous dots above and below streak; cilia whitish, beneath apex and at anal angle dark-fuscous. Hindwings dark-grey, with bronzy reflections; cilia grey.

Distinguished by the pale colouring, large apical area not occupied by purplish band, and dark subapical streak.

Brisbane, Qneensland; one specimen in April.

GRACILARIA PARALLELA, *Turn.**

Brisbane, from July to November; attached to *Acacia Cunninghami* and *Acacia aulacocarpa.*

GRACILARIA LACINIELLA, *Meyr.*

Very common in Brisbane from August to October, but

* In the description of this species, for "alternating" read "attenuating."

smaller in size than specimens from Sydney. The larvæ are tapering posteriorly, of a pale-yellowish-green, and nine roundish blotches in the leaves of *Eucalyptus piperita* (?) and *Eucalyptus eugenioides*, on which they are sometimes very abundant.

Gracilaria tristainæ, *Turn.*

I have bred this species also from *Eugenia ventenatii*. Like the preceding, the antennæ are porrected in repose.

Brisbane, from September to December.

Gracilaria ophiodes, *Turn.*

I took four specimens, all larger and finer than the type, on a fence in Warwick, Queensland, in October.

Gracilaria polyplaca, *Lower.*

Male and female, 10-12 mm. Differs from *G. ida*, Meyr., as follows:—Thorax crimson, with two whitish spots posteriorly, anterior portion wholly crimson. (In *G. ida*, thorax is whitish, with median and lateral reddish lines.) Forewings clear crimson, never suffused with grey; two basal dorsal spots widely separate (in *G. ida* these are usually, if not always, confluent); first costal streak absent, replaced by two discal spots; fourth and fifth costal streaks not touching, but separated by a band of ground colour; black margins of fifth, sixth, and seventh costal streaks not reaching to costal edge.

Closely allied to *Gracilaria ida*, Meyr., the description of which includes both species, but certainly distinct; formerly described by myself as var. *rosea*. From *Gracilaria formosa*, Stt., as defined by Meyrick, it may be distinguished by absence of pale-yellowish suffusion along costa, absence of spot on fold, and by most of the other points mentioned above.

Brisbane, Queensland; taken abundantly from August to October, and again in April, attached to *Tristania conferta* and *Tristania suaveolens*. *G. ida* I have always found attached to *Eucalyptus piperita* (?), *G. formosa* to *Eugenia ventenatii*.

Gracilaria albicincta, *n. sp.*

Male, 8½ mm. Head and thorax pale-ochreous-brown. Maxillary palpi ochreous-whitish. Labial palpi ochreous-whitish; second joint with an apical, terminal joint with a median and subapical dark-fuscous ring. Antennæ longer than forewings, ochreous-whitish, annulated with dark-fuscous. Abdomen ochreous-fuscous; beneath whitish. Legs whitish; apices of tarsal joints fuscous; anterior and middle femora and tibiæ and basal half of posterior femora dark-fuscous, mixed with brownish; middle tibiæ much thickened with scales. Forewings reddish ochreous-fuscous, with scattered dark-fuscous scales; an out

wardly oblique whitish fascia before middle, edges parallel, well defined, with dark-fuscous scales; some half-dozen dark-fuscous dots in fascia; basal part of disc darker coloured than beyond fascia; cilia dark-fuscous, with a whitish subapical line, at anal angle whitish. Hindwings and cilia dark-grey.

Nearest *G. xylophanes*, Turn., but very distinct by the oblique whitish fascia.

Brisbane, Queensland; one specimen in September.

Gracilaria leptalea, *n. sp.*

Male and female, 6-7 mm. Head and thorax whitish. Palpi white; second joint with an apical, terminal joint with a median dark-fuscous ring. Antennæ dark-grey. Abdomen dark-grey. Legs whitish; apex of tarsal joints fuscous; anterior tibiæ and first tarsal joints, outer aspect of distal portion of middle and posterior tibiæ dark-fuscous. Forewings ochreous-fuscous; a white line along inner margin, somewhat dilated at anal angle, much obscured by dark-fuscous scales, especially from one-fourth to middle; a fine line from costa at one-fourth, running closely beneath costa to three-fourths, there bent obliquely across disc to anal angle; its lower margin suffused with dark-fuscous, oblique portion edged on both sides with dark-fuscous; middle third of costal edge narrowly white; an oblique white streak from costa before apex towards middle of hindmargin; cilia white, with a median and apical dark-fuscous line, on anal angle grey. Hindwings and cilia grey.

A minute species, very distinct from any other I have seen. It cannot be *G. albomarginata*, Stt., which is a larger insect without oblique fasciæ.

Brisbane, Queensland; six specimens on a fence in August and September, almost certainly derived from *Acacia Cunninghamii*.

Ornix trigonophora, *n. sp.*

Male and female, 10-11 mm. Head and palpi white. Antennæ grey. Thorax white, sides fuscous-grey. Abdomen grey, tuft white. Legs white, annulated with grey; anterior pair grey. Forewings narrow-elongate; fuscous-grey, markings white; a broad line along inner-margin, its posterior half containing several streaks of ground-colour; three short oblique lines from costa at two-fifths, three-fifths, and four-fifths; a straight fuscous line, with leaden metallic lustre from costa before apex to anal angle; a dark-fuscous line around margin at apex, enclosing with the preceding a triangular white area, within which is a greyish-ochreous blotch, containing a central blackish spot; cilia white, at apex with apices dark-fuscous, at anal angle grey. Hindwings and cilia grey.

Mt. Tambourine, Queensland; a dozen specimens taken at one spot in November.

ORNIX ACROBAPHES, *n. sp.*

Male, 11 mm. Head and palpi white. Antennæ grey. Thorax grey (?). Abdomen grey, tuft white. Legs white, annulated with fuscous; anterior pair mostly fuscous. Forewings narrow-elongate; grey, markings white, a broad streak along inner-margin, several very short streaks from costa; ante-apical portion of disc mostly white, containing two short parallel longitudinal dark-fuscous streaks; apical portion white, enclosed in a triangular fuscous line, and containing a grey blotch, with central dark-fuscous spot; cilia white, at apex with apices dark-fuscous, at anal angle grey. Hindwings grey, apical half intense black, the boundary line is irregular; cilia grey.

Closely allied to the preceding, but at once distinguished by the blackish hindwings. The type is not in perfect condition.

Brisbane, Queensland; one specimen in January.

LEIOPRORA, *n. g.*

Head smooth. Tongue short. Antennæ considerably over one, in male simple, basal joint dilated and concave beneath to form eyecap. Labial palpi short, filiform, drooping, pointed. Maxillary palpi rudimentary. Posterior tibiæ with short stiff hairs on upper surface. Forewings with 1 b furcate at base, transverse vein rudimentary, 3 and 4 absent, 6, 7, and 9 stalked, 7 to costa, 8 absent. Hindwings linear, cell open, 3, 4, 5, and 6 absent.

Allied to *Lyonetia*, Hb., and *Phyllocnistis*, Zel. Distinguishable from the former by the smooth head, and from the latter by the long antennæ, also by the neuration.

LEIOPRORA ASCEPTA, *n. sp.*

Male and female, 5-7 mm. Head ochreous-fuscous, face and palpi white. Antennæ greyish, basal joint whitish. Thorax ochreous-fuscous. Abdomen grey. Legs whitish, anterior tibiæ and tarsi fuscous. Forewings narrow-elongate; ochreous-fuscous, with golden reflections; an indistinct fuscous suffusion on base of inner-margin, and another on costa before middle; a suffused fuscous line from inner-margin at two-thirds obliquely through disc to apex; cilia whitish, apices fuscous, at anal angle grey, with a blackish apical dot, edged towards costa with a few golden-metallic scales. Hindwings and cilia grey.

Brisbane, Queensland; taken rather commonly on fences from June to September.

Opostega nubifera, *n. sp.*

Male, 8 mm. Head and palpi white. Antennæ greyish; basal joint white. Thorax white. Abdomen dark-grey. Legs whitish; anterior pair grey. Forewings elongate; white; markings suffused greyish; two rather broadly suffused acutely angulated fasciæ, first before middle, second beyond middle, interrupted in disc; a rather broad grey line around apex and hindmargin; cilia grey-whitish, at apex with basal half white, interrupted by a narrow oblique blackish bar. Hindwings and cilia grey.

Resembles *O. chalinias*, Meyr., but distinguished by the wholly white head, and the rather broadly suffused markings without golden-fuscous-tinge.

Toowoomba, Queensland; one specimen in September.

ELACHISTIDÆ.

Stathmopoda mannophora, *n. sp.*

Male, 14 mm. Head dark-fuscous; face white. Palpi, external surface dark-fuscous, internal surface white. Antennæ whitish-ochreous. Thorax white, with a moderate posterior dark-fuscous spot. Abdomen grey; edges of segments and tuft whitish-ochreous. Legs pale-ochreous; anterior pair fuscous. Forewings white; a moderate dark-fuscous basal fascia; a moderate fuscous-brown fascia from costa at two-thirds to anal angle; cilia on costa whitish-ochreous, at apex fuscous, thence grey, becoming whitish-ochreous again on inner-margin. Hindwings grey; cilia grey, towards base of inner-margin whitish-ochreous.

Allied to *S. pantarches*, Meyr., but at once distinguished by the dark-fuscous head.

Brisbane, Queensland; one specimen in November, taken by Mr. H. Tryon.

Lozostoma asema, *n. sp.*

Female, 10-11 mm. Head dark-fuscous, narrowly edged posteriorly with yellow; face and fillet whitish. Palpi whitish. Antennæ whitish. Thorax bright-yellow. Abdomen grey. Legs whitish; anterior pair fuscous. Forewings bright-yellow; sometimes a minute dark-fuscous dot in disc beyond middle; cilia bright yellow. Hindwings and cilia grey.

Distinguished by the absence of marking.

Brisbane and Mt. Tambourine, Queensland; four specimens in October and November.

Notes on a Collection of Birdskins from Kalgoorlie, W.A.

By Robert Hall.

[Communicated by Professor E. C. Stirling.]

[Read April 3, 1900.]

Kalgoorlie, Alice Springs, and Derby are approximately 1,000 miles from each other, embracing a triangular-like mass of desert-land, of which the bases are about equal and not unlike. As we have a fairly good record of the birds of Derby and Central Australia, it remains for us to provide a list of what species are known to be associated with the South-West position. To Mr. Lindsay Cameron I am indebted for a nice collection of skins. From his memoranda I gather the country is very desert-like, as far as animal life is concerned. It is, in the main, flat, with low rounded hills every few miles, and is covered with short and dry eucalyptus-scrub some 15 feet high. Occasional Casuarinas are seen, with Salsolaceæ interspersed between the gums. Eucalypts, perhaps 50 feet high, are represented with their branches meagrely supplied with foliage. There appears to be no surface water away from the mining camps, which use it only when condensed. The numerous lacustrine beds hold water for a short time, and get it only after irregular thunder storms. "At the present time," Mr. Cameron writes, "the Government of this colony is supplying us from a part some 300 miles distant." From this information we may gather that water-birds will not be mentioned in this present list, and that it is a land in which an Eastern man so much misses the organ-pipe strains of the Magpies *(Gymnorhinæ)* and the piping notes of the Magpie Lark *(Grallina)*.

To deepen the interest, I supply some few field notes of personal observation upon Eastern specimens of the same species.

Those to which the asterisk is added have received notice by the Sir Thomas Elder Expedition, when above Kalgoorlie, and as recorded in the Trans. Roy. Soc., S.A., XVI., p. 156. Eighteen specimens of ten species are there noted as the total ornithological results of that long journey. The Bower-bird (*Chlamydodera guttata*) appears to have been the most important find, and not before or since recorded as found in W.A. The Cockatoo *(Cacatua roseicapilla)* was at that time noted as well, this being one of three field observations in the West to date. Recorded now as found in West and South-West Australia is the yellow-

throated Minah *(Manorhina flavigula).* It has probably made its course from the centre of the Eyrean sub-region, where it has long been known to exist. The species received by myself are 33 in number. Mr. Cameron has noted in addition ten species. Of the ten species recorded by the Elder Expedition further North, seven are found near Kalgoorlie township.

CERCHNEIS CENCHROIDES, *Vig.* and *Hors.*

Tinnunculus cenchroides, V. and H.; *id.*, Gould, Bds. Austr., fol. vol. I., pl. 13.

Cerchneis cenchroides, Sharpe, Brit. Mus. Cat. Bds., I., p. 431; Hall, "Key to the Birds of Austr.," p. 3.

Adult skin (unsexed), December, 1898. Bars on tail feathers almost obsolete. Both sexes take part in incubation, the male sitting in the hollow of another tree during the night and relieving its mate in the task of incubation during the day. The young when ready to fly are without the yellow cere.

HIERACIDEA ORIENTALIS, *Schlegel.*

Hieracidea berigora, Gould., Bds. Austr., fol. vol. I., pl. 11.

Hieracidea orientalis, Sharpe, Brit. Mus. Cat. Bds., vol. I., p. 422; Hall, "Key to the Birds of Austr.," p. 3.

One juvenile skin received.

PACHYCEPHALA GILBERTI, *Gould.*

Pachycephala gilberti, Gould, Bds. Austr., fol. II., pl. 71; Gadow, Brit. Mus. Cat. Bds., vol. VIII., p. 210; Hall, "Key to the Birds of Austr.," p. 34.

a. Skin, male, 16/10/'98. This specimen does not show a black pectoral collar.

b. Skin, immature male, 26/9/'99. Upper surface with a slight disposition to ashen grey on crown and back, throat and abdomen greyish-white, chest and breast grey, lores grey, wings greyish, tips of primaries being brown; tail grey, upper-tail coverts clear grey, under wing coverts sandy buff. Length of wing, 3·75 ins.; tail 3·5 ins."

On September 1st a nest was found containing four eggs, three being the hitherto recorded number to a clutch. The nest was composed of small sticks and bark, the measurements being—Exterior diameter, 6 ins.; depth of cavity, 4 ins.; total depth, 6 ins.; depth of cavity, 2 ins. Height of nest from ground, 5 feet.

ACANTHIZA APICALIS, *Gould.*

Acanthiza apicalis, Gould, Bds. Austr., fol. vol. III., pl. 57; Sharpe, Brit. Mus. Cat. Bds., VII., p. 296; Hall, "Key to the Birds of Austr.," p. 25.

Skin, adult male, 14/8/'98.

It is a plentiful bird here.

SERICORNIS BRUNNEA, *Gould.*

Pyrrholæmus brunnea, Gould, Bds. Austr., fol. vol. III., pl. 68· *Sericornis brunnea*, Sharpe, Brit. Mus. Cat. Bds., VII., p. 302 ; *id.*, Hall, "Key to the Birds of Austr.," p. 26.

Skin, adult male, 12/3/'99. *Loc.*—Golden Ridge.

MICRŒCA ASSIMILIS, *Gould.*

Micræca assimilis, Sharpe, Brit. Mus. Cat. Bds., vol. IV., p. 124 ; Hall, "Key to the Birds of Austr.," p. 13.

Adult skin (unsexed), 16/10/'98.

POMATORHINUS SUPERCILIOSUS, *Vig.* and *Hors.*

Pomatorhinus superciliosus, Gould, Bds. Aust., fol. vol. IV., pl. 22 ; Sharpe, Brit. Mus. Cat. Bds., vol. VII., p. 419 ; Hall, "Key to the Birds of Austr.," p. 29.

a, b. Male and female, 19/3/'99.

c, d. Immature skins, 17/1/'99, 19/3/'99.

XEROPHILA, *sp.*

The one skin received does not agree with any of the known species as described. *X. leucopsis* is the only species of the genus in Western Australia, and with that it has very little agreement. A provisional description was given by the writer in the "Victorian Naturalist," XVI., No. 2.

CINCLOSOMA CASTANONOTUM,* *Gould.*

Cinclosoma castanonotus, Gould, Bds. Austr., fol. vol. IV., pl. 5.

Cinclosoma castanonotum, Sharpe, Brit. Mus. Cat. Bds., VII., p. 333 ; Hall, "Key to the Birds of Aust.," p. 27.

Adult skin, male, 2/12/'98. The back and rump feathers are dull chestnut, compared with the rich chestnut of the Eastern birds in my cabinet.

CLIMACTERIS RUFA, *Gould.*

Climacteris rufa, Gould, Bds. Austr., fol. vol. IV., pl. 94 ; Gadow, Brit. Mus. Cat. Bds., VIII., p. 335 ; Hall, "Key to the Birds of Austr.," p. 35.

Adult skin, male, 24/7/'98.

The common tree-creeper of this district.

CLIMACTERIS SUPERCILIOSA, *North.*

Climacteris superciliosa, North, "Horn Exp. Cent. Aust.," Zool., plate ; Hall, "Vic. Nat.," vol. XVI., No. 11 ; *id.*, "Key to the Birds of Austr.," p 35.

a. Skin, male, 30/10/'98. *b.* Skin, female, 24/11/'98.

I am in receipt of a skin from Nannine, N.W.A., and dated 30/7/'99. It is probably a female, and shows the two central

tail feathers to be brown rather than grey, the colour of the upper tail coverts.

PETRŒCA BICOLOR, *Vig.* and *Hors.*

Petroica bicolor, Gould., Bds. Austr., fol. vol. III., pl. 7.

Petræca bicolor, Sharpe, Brit. Mus. Cat. Bds., vol. IV., p. 173; Hall, "Key to the Birds of Austr.," p. 14.

Adult skin (not sexed), 11/12/'98.

The habits of this bird are very different to those of the other members of this family, and one would scarcely know it to belong to the Robins. It pipes its trilling notes from early to late, and when other Robins are in the shade, this is most actively chasing and capturing grasshoppers. It freely associates with other birds (as the Artamidæ). Amongst birds in general, there appears to be security in numbers.

PETRŒCA GOODENOVII, *Vig.* and *Hors.*

Petroica goodenovii, Gould, Bds. Austr., fol. vol. III., pl. 5.

Petræca goodenovii, Sharpe, Brit. Mus. Cat. Birds, vol. IV., p. 171; Hall, "Key to the Birds of Austr.," p. 13.

a. Adult skin, male, 20/1/'99. *c.* Skin, juv. male, Dec., 1898.
b. Immature skin. *d.* Skin, juv. female, Dec., 1898.

(*a*). It is blacker on the throat and duller on the breast than the Eastern skins in my collection. The forehead "reds" bear the same relation to the breast "reds" in each.

(*b*). It has the basal frontal mark duller than in (*a*) and much less of it. The breast red is dull, throat brownish-black.

(*c*). It has only a trace of red on the forehead and pectoral regions; throat, crown, and nape greyish-brown.

(*d*). It has a faint trace of red on the forehead, none on the breast.

The plumage of what are called the Red Robins is quite imperfect at the close of 12 months, yet in this phase they nest and rear a family. Immature birds in Victoria have nested in August of different years. Matured birds will breed twice in a season with two to three eggs laid on successive days. Incubation lasts 14 days, during which the disturbed bird will often feign injury when you approach the nest. Mr. J. A. Hill, of Kewell, in a letter to me gives the time between the starting of nest-building to laying of first egg as ten days. On February 15, 1899, I secured a young male skin in Victoria showing the change from the brown plumage to the showy one. The tawny feathers of the forehead had mostly given way for the brilliant reds; one patch of brownish feathers remained on the chest, while all the others either had "burst their buds" or were doing so into bright-red. Excepting the middle feathers, all the others of the tail were short and irregularly graduated. The brownish

wing primaries were giving way to the black quills in order from the first; the earthy plumes of the remaining parts of the body were making place for the blacks; abdomen and lower tail coverts were already white.

Gould proved *P. leggii* to moult its "reds" annually. A new supply shows out almost patch for patch in *P. phœnicea* in February (skins, 26/1/1900, described Roy. Soc. of Vic.). The song of this species is clear and strong, like *P. leggii*, but is much sweeter and of a different setting.

ARTAMUS PERSONATUS, *Gould.*

Artamus personatus, Gould, Bds. Austr., fol. vol. II., pl. 31; Sharpe, Brit. Mus. Cat., Bds., vol. XIII., p. 16; Hall, "Key to the Birds of Austr." p. 48.

Immature skin, female, 24/11/'98. The mask is not so well defined as in adult skins, and the outer borders of the primaries are edged with light-brown.

This species, like *Corvus coronoides*, places outposts as an act of prevention when bellicose birds are in the neighbourhood. They change their sentinels irregularly, but are always sure to have some three to four birds perched on an elevated position watching the interests of the general body of feeders below. Others fly up at intervals to take up the duty. If an enemy, say in the shape of a Crow-shrike, appears, the sentinels' necks croon forward, and discordant calls, louder and in quicker time than is usual, are given. The colony is on the wing at once in readiness for an attack, and they certainly seem to think discretion is the better of valour, for away they go to take up a position elsewhere. A very similar observation has been communicated to me by Mr. Geo. Graham concerning *A. superciliosus*. In this case the enemy seemed specially to be the White-backed Crow-shrike (*G. leuconota*).

ARTAMUS SORDIDUS, *Latham.*

Artamus sordidus, Gould, Bds. Austr., fol. vol. II., pl. 27; Sharpe, Cat. Bds. Brit. Mus., vol. XIII., p. 19; Hall, "Key to the Birds of Austr.," p. 48.

a. Skin, female, 14/8/'98. No white in third primary—indicates not quite mature. Second primary longer than first.

b. Skin, nestling male, 10/12/'96. The upper and under surfaces brown, streaked and spotted with dusky white, much stronger on the upper; wings deep slate, second and third primary edged with clear white on the outer webs, coverts wedge-marked with brown at tips; tips of primaries clearly marked by white, also shoulder of wing, both of which entirely disappear in the adult; distal third of rectrices white, bill brown, legs and feet slatey-brown. Length of wing, 3·1 ins.; culmen, 0·4 ins.; tail, 1·5 ins.

The following portion of their gregarious habit is specially interesting :—*Roosting for the Night.*—Usually in fine weather the sheltered side of a rough shell of an old tree is selected. When cold nights prevail, a stump, so burnt that the upper part forms an inverted funnel, is then chosen. The interest is to watch the shuffling upward movements of the birds as they move towards and enter the hole. While those on the stump are getting safely housed, their numbers are added to by more that are flying about and watching their opportunities. Sometimes the hole is not large enough to hold all; they then cluster in a great bunch (like a bee-swarm when at rest) beneath the dome. Hence the generic name *Artamus*, and a previous reference under other conditions. Should a person pass too near, there is a nerve-startling rush, such as a tree falling close to you would produce, and the process of camping has to be repeated.

PARDALOTUS ORNATUS, *Temm.*

Pardalotus striatus, Gould, Bds. Austr., fol. vol. II., pl. 38.

Pardalotus ornatus, Sharpe, Brit. Mus. Cat. Bds., vol. X., p. 55; Hall, "Key to the Birds of Austr.," p. 46.

a, *b*. Skins, adult male and female, 4/9/'98.

COLLYRIOCINCLA RUFIVENTRIS, *Gould.*

Collyriocincla rufiventris, Gould, Bds. Austr., fol. vol. II., pl. 75; Sharpe, Brit. Mus. Cat. Bds., vol. III., p. 292; Hall, "Key to the Birds of Austr.," p. 11.

a. Skin, adult female, 14/8/'98.

b. Skin, immature female, 4/9/'98.

(*a*). General plumage brownish-grey, lores and other parts corresponding with the tint of brown over most of the grey. Bill black; length, 0·9 inch.

(*b*). General colour of plumage grey, lores and other parts agreeing, except region of vent and under tail coverts, which correspond with those of *a*. Bill light-horn, blacker along the culmen; length, 0·75 inch.

The immature female has the eyebrow like its surroundings in colour.

TAENIOPYGIA CASTANOTIS, *Gould.*

Amadina castanotis, Gould, Bds. Austr., fol. vol. III., pl. 87.

Tæniopygia castanotis, Sharpe, Brit. Mus. Cat. Bds., vol. XIII., p. 311; Hall, "Key Bds. Austr.," p. 50.

Skin, male, 20/11/'98. Forehead and crown uniform grey; under portion of tail deep brown.

That this species is a "host" of the cuckoo, *Chalcococcyx basalis*, is now placed on record. Mr. Cameron writes—"A colony of the chestnut-eared Finch had its nests sprinkled about, some having

eggs, and others vacant. In one of the latter I found the cuckoo's egg (skin since received). I left it, and several days after (November 19) I visited the nest, and found no other eggs added. The Finches had deserted. In one tree there were as many as 30 nests. In the split spout of a eucalypt the nest is occasionally built." A favourite situation in the orient is at the base of a Crow or Hawk's nest, and the Finch and Hawk perch within a foot of each other amicably. One nest had a clutch of nine eggs. Sometimes the rudely-built nests meant for the non-sitting bird will contain eggs. The compactness of the nest will depend on the surroundings and its material. Several nests placed in polygynum were very small and slightly built. It prefers open and dry country, although its presence is indicative of water not being far away. Mr. J. P. Rogers has communicated to me a field note of value. Inland from the Fitzroy River two of us had a terrible thirst experience, and, although we watched a hundred of this bird, we could not find water along the creek bed. Watching carefully a dozen, we saw them settle in the bowl of the lowest fork of a large mulga, and, following them, we found about two tablespoonfuls of water in it. This is about what is saved from a slight thunderstorm, and we are pleased to acknowledge the service rendered by a species of Finch.

EPHTHIANURA TRICOLOR,* *Gould.*

Ephthianura tricolor, Gould, Bds. Austr., fol. vol. III., pl. 66; Sharpe, Brit. Mus. Cat. Bds., vol. VII., p. 667; Hall, "Key Bds. Austr.," p. 30.

Skin, adult male.

This Chat appears in great numbers at Kalgoorlie by the end of October, and begins to depart towards the end of December. Further North *E. aurifrons* has been noticed (Elder Exp.).

OREOICA CRISTATA,* *Lewin.*

Oreoica gutturalis, Gould, Bds. Austr., fol. vol. II., pl. 81.

Oreoica cristata, Gadow, Brit. Mus. Cat. Bds., VIII., p. 174; Hall, "Key Bds. Austr.," p. 32.

a. Skin, juv. male, 13/3/'99. Forehead brownish-grey, crest feathers light black and less in number than in the adult; back less ruddy than in adult; throat fawn-grey, with two whitish feathers on the gorget; one to two blacks showing on breast; winglet new.

b. Skin, adult male. The forehead is black, while the lores are the creamy colour of the throat. The lores of *a* are brownish, like the forehead, with a flush of grey over them.

The call of the young differs from that of the adult, and Mr. Cameron clearly distinguishes it from the call of the Eastern

bird. The aborigines of W.A. have noted two settled calls. This supports the statement of Dr. Stirling and Mr. Zeitz (Roy. Soc., S.A., XVI., p. 156) that they are the calls of young and old of the same species. A nest with three eggs was hidden in a group of young leaves.

CRACTICUS DESTRUCTOR, *Temm.*

Cracticus destructor, Gould, Bds. Austr., fol. vol. II., pl. 52; Gadow, Brit. Mus. Cat. Bds., vol. VIII., p. 100; Hall, "Key Bds. Austr.," p. 32.

By examining a series of skins, I find the most developed male may be recognised by the white throat, grey back, flanks and sides of upper breast greyish-white; culmen, 1·62 inches. The development is from deep-brown on the dorsal region to black and grey; from light-brown on the under surface to a nearly clear white under surface in the adult. The brown barring on the young is displaced by the faint blue-grey on the sides of the breast in the adult.

a. Skin, juv. male, 11/12/'98. The feather-shafts from the forehead to the interscapulum are rufous-brown.

b. Skin, female fledgling, about three days out of nest, 20/11/'97. Head, neck, and back deep-brown; rump light-brown; upper tail coverts light-brown, barred with deep-brown; centres of cheek feathers light-brown; sides of neck show brown patches; lores brown; throat, abdomen, and under tail coverts white, tinged with brown; chest and breast brown and brownish-white, the brown forming blotches and bars; wings deep-brown, secondaries and coverts edged with pale-rufous; tail brown, tipped with white, tinged with pale-rufous; bill brownish-black at the base, brown at the tips; legs slatey-brown. Length of wing, 4·3 ins.; tail, 2·8 ins.; culmen, 0·85."

PTILOTIS ORNATA, *Gould.*

Ptilotis ornata, Gould, Bds. Austr., fol. vol. IV., pl. 39; Gadow, Brit. Mus. Cat. Bds., vol. IX., p. 244; Hall, "Key Austr. Bds.," p. 43.

a. Skin, adult female, 4/9/'98. *Loc.*—Golden Ridge.

b. Skin, adult female, 16/10/'98. *Loc.*—Kalgoorlie Centre. The two centre tail feathers were very much decomposed.

c. Skin, immature, 2/4/'99. *Loc.*—"Hannan's Lake." General plumage browner than in *a* or *b*. More yellow on wings; breast more heavily blotched with brown; edges of inner webs of primaries edged with fulvous. New tail quills were developing, and the bird was concluding its autumn moult.

MANORHINA FLAVIGULA, *Gould.*

Myzantha flavigula, Gould, Bds. Austr., fol. vol. IV., p. 79.

Manorhina flavigula, Gadow, Brit. Mus. Cat. Bds., vol. IX., p. 261; Hall, "Key Austr. Bds.," p. 44.

Skin, adult female, 5/3/'99. Length of wing, 4·7 ins.; tail, 4·5 ins.

This bird was concluding its moult, and the innermost quill was "bursting." The winglet feathers had their sheaths still attached.

The finding of *M. flavigula* in West or S.W. Australia is now placed on record, and the law of representation with this genus, as defined by Gould, is a little interfered with. In likely probability it has journeyed from the central portion of the continent.

GLYCYPHILA ALBIFRONS, *Gould.*

Glycyphila albifrons, Gould, Bds. Austr., fol. vol. IV., pl. 29; Gadow, Brit. Mus. Cat. Bds., vol. IX.. p. 211; Hall, "Key Bds. Austr.," p. 39.

a. Immature skin, 27/11/'98.

b. Immature skin, male, 27/11/'98. Forehead black, a few of the lateral feathers feebly tipped with slatey-white; around eye black, a faint ring of white appearing; crown black; narrow line leaving angle of lower mandible, white; ear coverts silvery-slate, behind which is an irregular line of white; chin feathers dusky-black, edged with impure white; primaries and primaries-coverts-margins yellowish-green; under surface of wing fulvous; upper tail coverts rufous, central parts black; abdomen, flanks, and under tail coverts whitish, with centres of feathers narrowly marked with brownish-black; bill, legs, and feet black. Wing, 3 ins.; tail, 3 ins.; tarsus, 0·8 ins.; culmen, 0·65 ins.

ENTOMPHILA LEUCOMELAS, *Cuvier.*

Melicophila picata, Gould, Bds. Austr., fol. vol. IV., pl. 49.

Entomophila leucomelas, Gadow, Brit. Mus. Cat. Bds., vol. IX., p. 220; Hall, "Key Bds. Aust.," p. 40.

Skin, adult female, 19/10/'98.

CUCULUS PALLIDUS, *Latham.*

Cuculus inornatus, Gould, Bds. Austr., fol. vol. IV., pl. 85.

Cuculus pallidus, Shelley, Brit. Mus. Cat. Bds., vol. XIX., p. 261; Hall, "Key Bds. Austr." p. 58.

Skin, adult male, 4/9/'98.

The male skins in my cabinet appear to fall into three phases in the development of the plumage:—

a. Young, in which white predominates throughout the plumage, the feathers being broadly edged and dentated by the white; quill tips also white; the pigment of the plumage beyond the white patches is blackish-brown. Bill nutty-brown; culmen, 0·65 in.

b. Immature, in which white does not predominate throughout the plumage. The feathers are narrowly edged with white, and

feebly dentated by the white; quill tips not edged with white other than the third, and that slightly so. The pigment of the plumage as a whole is dark-brown. Bill blackish; culmen, 0·8 in.

c. Adult, in which there is little white throughout the plumage, the feathers not being edged with white, and some of the quills and rectrices alone dentated with white; plumage generally light-brown. Bill blackish; culmen, 0·85 in., and broader at nostrils than in *a* or *b*.

CHALCOCOCCYX BASALIS, *Horsf.*

Chrysococcyx lucidus, Gould, Bds. Austr., fol. vol. IV., pl. 89.

Chalcococcyx basalis, Shelley, Brit. Mus. Cat. Bds., vol. XIX., p. 294; Hall, "Key Bds. Austr.," p. 59.

An egg only of this bird was sent to me, but subsequently I was personally able to collect the species just N.E. of Albany.

MISOCALIUS PALLIOLATUS, *Latham.*

Chalcites osculans, Gould, Bds. Austr., fol. vol. IV., pl. 88.

Misocalius palliolatus, Shelley, Brit. Mus. Cat. Bds., vol. XIX., p. 279; Hall, "Key Bds. Austr.," p. 59.

Skin, adult female, 4/9/'98.

HALCYON PYRRHOPYGIUS, *Gould.*

Halcyon pyrrhopygia, Gould, Bds. Austr., fol. vol. II., pl. 22.

Halycon pyrrhopygius, Sharpe, Brit. Mus. Cat. Bds., XVII., p. 258; Hall, "Key Bds. Austr.," p. 57.

The adult skin dated December, 1896, has a pale-green head and a clear white nuchal collar.

PSEPHOTUS MULTICOLOR, *Temm.*

Psephotus multicolor, Gould, Bds. Austr., fol. vol. V., pl. 35; Salvadori, Brit. Mus. Cat. Bds., vol. XX., p. 566; Hall, "Key Bds. Austr.," p. 67.

a. Skin, adult female, 11/12/'98.

b. Skin, adult male, 11/12/'98.

c. Skin, adult male, 15/3/'99.

a, *b*, and *c* indicate three distinct phases of the plumage:—

(*a*) Primaries, secondaries, their coverts, the tail and its coverts very much decomposed.

(*b*) General plumage above olive, as well as upon the throat and chest; breast light-green; abdomen lemon-green; shoulder feathers dull-red.

(*c*) The olive of (*b*) is bright-green; abdomen orange and yellow; shoulder feathers bright-yellow, illustrating xanthochroism.

Specimen (*b*) would need to go through another moult to

obtain a brighter frontal yellow band, a clearer red upon the shoulders, and more white upon the tail feathers to become fully adult.

BARNARDIUS ZONARIUS, *Shaw.*

Platycercus bauri, Gould, Bds. Austr., fol. vol. V., pl. 20.

Barnardius zonarius, Salvad., Brit. Mus. Cat. Bds., XX., p. 560; Hall, "Key Bds. Austr.," p. 66.

Adult skin, 19/2/'99. The specimen was concluding a moult, for the last of the yellow feathers of the breast were "bursting." All but the outer three quills have a maculated line upon the under surface of the wing. In the South-West this species nips off the blossoms of the eucalypts when they have once been explored for nectar. It is not improbable that this is the means for saving the labour of re-examining a flower. Thousands of blossoms daily fall by this means.

MELOPSITTACUS UNDULATUS, *Shaw.*

Melopsittacus undulatus, Gould, Bds. Austr., fol. vol. V., pl. 44; Salvad., Brit. Mus. Cat. Bds., vol. XX., p. 594; Hall, "Key Bds. Austr.," p. 68.

Skin, adult male, 16/10/'98.

The species flocks into the district in July, and pairs in October, as far as noted. The skin received showed an inner quill missing from one wing, and one strangely growing from the lower back. It appeared to be identical with the missing one. The not unusual occurrence of a snake entering the nest of a bird occurred under Mr. Cameron's notice, and the four eggs were eaten by the reptile, after which it slept for several hours in the nest.

The following species have been recognised by Mr. Cameron, without the skins being forwarded to the writer:—

Uroaëtus audax, Latham.
Falco melanogenys, Gould.
Corone australis, Gould.
Graucalus melanops, Latham.
Podargus phalænoides, Gould (?).
Eupodotis australis, Gray.
Dromæus novæ-hollandiæ, Latham.
Cheramœca leucosternum, Gould.
Plectrorhynchus lanceolatus,* Gould.
Gymnorhina dorsalis, Camp.
Rhipidura tricolor. Vieill.

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* Not yet recorded as a W.A. species.

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

XXVI.

[Read May 1, 1900.]

CARABIDÆ.

CLIVINA.

C. eyrensis, sp. nov. Minus convexa; sat nitida; brunneo-testaceus; mandibulis brevibus; clypeo ab "alis" distincto, quam hæ magis producto, antice fere truncato ad extremitates angulato; oculis sat (fere ut *C. Bovillæ*, Blackb.) convexis; prothorace quam longiori paullo latiori, fortiter anguste canaliculato, antice leviter angustato, latera versus transversim leviter rugato vix punctulato, foveis posticis fere nullis; elytris sat æqualiter sat profunde striatis, striis parum manifeste punctulatis, stria quinta antice cum externis conjuncta; tibiis anticis extus tridentatis. Long., $2\frac{4}{5}$ l.; lat., $\frac{9}{10}$ l.

From the characters mentioned above it will be seen that this species falls into the group called by Mr. Sloane (Proc. L.S., N.S.W., 1896, p. 151) the "*obliquata* group." Of the species included in that group and known to Mr. Sloane only one species (*C. Riverinæ*) agrees with the present one in being of subdepressed form, and with its prothorax wider than long; from which the present insect differs notably by *inter alia* the fifth and sixth elytral striæ deeply impressed throughout their whole length (and not, or scarcely, less strongly impressed than the other striæ), by the almost complete absence of elongate foveæ near the base of the pronotum, and by its more convex eyes. From the species of the *obliquata* group not known to Mr. Sloane (of all of which the types are in my collection) *C. eyrensis* differs by its much more convex eyes.

S. Australia; near Lyndhurst (Lake Eyre basin), taken by Herr Koch.

C. Adelaidæ, Blackb. I take this opportunity of mentioning that this insect appears to me to be the species that Mr. Sloane identifies with *C. obliquata*, Putz. Mr. Sloane (*l.c.*) gives his reasons for thinking that *obliquata* is founded on an insect not

very readily recognisable by its author's description,—reasons that seem to be on the whole conclusive,—and therefore *C. Adelaidæ* must be quoted, I think, as a synonym of *obliquata*.

CYLCOTHORAX.

C. peryphoides, Blackb. Mr. Sloane in a recent valuable paper (P.L.S., N.S.W., 1899, p. 563) discusses the relation of this insect to his new species *C. cordicollis*, and mentions my having stated that the latter is distinct from it, proceeding to conjecture the distinctive characters. I fear, from this, that I must have answered his enquiries hurriedly and without giving my reasons for considering the two distinct,—for which if it was so I certainly owe him my apologies,—though it is possible he may have mislaid remarks I may have written on the subject and only remembered that I reported the two species as both valid. In point of fact they are closely allied but (apart from the great difference in the colour of the legs,—a character worthy of note when accompanied by structural divergence) the form of the prothorax furnishes a perfectly satisfactory distinction. In *cordicollis* the lateral margins of that segment (the short sub-basal parallel-sided part being disregarded) diverge for considerably more than half their length so that the greatest width of the segment is in front of the middle even of the part with curved sides, whereas in *peryphoides* the corresponding part of the lateral margin is an even curve, the greatest width of the prothorax being exactly at the middle of the curve, with the result of a very different facies, —the prothorax looking distinctly more transverse in *peryphoides* than in *cordicollis*, although careful measurement shows it to be only very slightly so. The lateral outline of the prothorax of *peryphoides*, if the short parallel sided basal piece be disregarded, is exactly like the lateral outline of that segment in *C. ambiguus*, Er. In *peryphoides*, moreover, the form of the whole insect is wider and less convex,—more robust-looking.

LAMELLICORNES.

CEPHALODESMIUS.

C. minor, sp. nov. Niger, antennis palpisque pallidis; sat opacus; clypeo brevius 4-dentato, dentibus medianis quam ceteri paullo longioribus; prothorace transverso, sat crebre minus fortiter punctulato, leviter canaliculato (canali antice obsoleto), ad latera ampliato-depresso, parte ampliata ad medium tuberculo parvo instructa, lateribus paullo ante medium et sat longe pone medium perspicue angulatis (inter angulos fere rectis sed retrorsum leviter convergentibus), angulis anticis sat acutis posticis fere rectis; elytris subsulcatis (ut *C. armigeri*, Westw., sculpturatis), setis brevibus crassis ferrugineis sparsim vestitis.

Maris pygidio sat convexo, opaco (apice anguste nitido), minus perspicue punctulato, setis ut elytra vestitis; tibiis posticis manifeste flexuosis.

Feminæ pygidio planato, ut maris sculpturato et vestito, parte postica nitida in medio retrorsum angulatim dilatata; tibiis posticis haud flexuosis. Long., 4½ l.; lat., 3 l.

Closely allied to *C. armiger*, Westw., but a little smaller, with the clypeal teeth shorter, and having the outline of the prothorax notably different. The lateral margin of that segment runs from the front angle obliquely hindward and outward, then making a well-defined angle runs nearly straight (but slightly inward) nearly to the base where it makes another angle, from which it runs very obliquely to the base. The outline between the front margin and the anterior of the lateral angles is almost strongly (and that between the lateral angles slightly) concave. Of the other described species of *Cephalodesmius*, *Castelnaui*, Har., and *Macleayi*, Har., are described as having nitid lævigate areæ or tubercles on the disc of the prothorax; *quadridens*, Macl., has the front part of the head impunctulate; *cornutus*, Macl., has the clypeal structure altogether peculiar, and *laticollis*, Pasc. (which is very slightly described) is stated to be much larger than the insect before me (long., 7 l.) with the prothorax wider than the elytra (in the present insect it is by measurement slightly narrower than the elytra), and it is implied that the prothorax is of the same shape as in *armiger*.

N.S. Wales; Richmond R. (sent by Mr. Lea).

C. armiger, Westw. The male of this species has the hind tibiæ scarcely flexuous and the pygidium very similar to that of *C. minor*, while the pygidium of the female resembles that of *C. minor* in having a nitid apical space dilated hindward in the middle,—but the shape of the dilatation is very different in the two species, being in *minor* a small triangular space in the middle of the narrow nitid edging of the segment, while in *armiger* the subtriangular nitid space covers the whole apical portion of the segment,—the lines that meet in an angle on the middle line of the segment having their other extremities at the lateral ends of the nitid space,—their angle thus being widely obtuse, while in *minor* it is acute.

LABROMA.

L. horrens, Shp. Mr. Lea has recently sent to me for identification a specimen of this insect. Dr. Sharp (Rev. and Mag. de Zool. 1873, p. 262) in characterising the genus stated that the type had no front tarsi, but that very probably they had been broken off. The example before me has front tarsi very similar o those of *Cephalodesmius*, to which genus it is very close.

PLATYPHYMATIA.

S. squalidus, Macl. Among some specimens sent to me by Mr. Cowley which agree very well with Sir W. Macleay's description of this insect, and which were taken in the same locality as the type, I find a single example, which I take to be the female. It agrees with the male in all respects of sculpture, &c., except in the anterior elevation of its prothorax being much less strong, its pygidium notably less gibbose, and its hind femora unarmed.

OCNODUS.

O. lepidus, sp. nov. Ferrugineus, clypeo picescenti, antennarum clava dilutiori; nitidus; fortiter punctulatus, elytrorum puncturis quam ceteræ manifeste majoribus; clypeo antice subrotundato; prothorace quam longiori duplo latiori, antice parum angustato, angulis anticis productis minus acutis posticis obtusis, lateribus leviter rotundatis, basi vix lobata; elytris obsolete tricostatis, haud setosis; tibiis anticis extus tridentatis. Long., $4\frac{1}{2}$ l.; lat., $2\frac{1}{3}$ l.

Differs from *O. spinicollis*, Blackb., and *fallax*, Blackb., *inter alia* by the obtuse hind angles of its prothorax, from *O. decipiens*, Burm., and *ferrugineus*, Blackb., by the absence of setæ on the upper surface, and from *lugubris*, Blackb., by the very much less close puncturation of its pronotum. The upper margin of the labrum is distant from that of the clypeus (as in *O. fallax*). The sculpture of the upper surface is in all parts very similar to that of *O. fallax*. It should be noted in respect of this insect (as I have pointed out in describing other species that I have attributed to *Ocnodus*) that it is possible it is not really congeneric with *O. decipiens*, Burm., a species that I have never been able to identify.

S. Australia; basin of Lake Eyre (taken by Herr Koch).

HETERONYX.

H. unicus, sp. nov. Sat brevis; sat latus; modice convexus; nitidus; subglaber, lateribus corpore subtus pedibusque sparsimpilosis; pallide brunneo-testaceus; capite confertim rugulose, prothorace sparsius sat fortiter, elytris inæqualiter (*i.e.*, puncturis sat grossis et aliis minoribus inæqualiter intermixtis), pygidio vix manifeste, punctulatis; clypeo fortiter reflexo antice late rotundato, sutura clypeali minus distincta; prothorace quam longiori fere duplo latiori, antice minus angustato, lateribus sat rotundatis pone medium vix subsinuatis, basi media late leviter lobata, angulis anticis parum productis posticis obtusis; elytris costis sat obsoletis circiter 4 instructis, his quam interspatia magis sparsim punctulatis; tibiis anticis extus 3-dentatis; labro clypeum

haud superanti; antennis 9-articulatis; coxis posticis quam metasternum multo brevioribus; unguiculis appendiculatis, parte basali quam apicalis vix longiori. Long., 4½ l.; lat., 2½ l.

An extremely distinct species notable for the apical piece of its claws being scarcely shorter than the basal piece, and the peculiar sculpture of its elytra, each of which bears about four longitudinally convex spaces extending from near the base to near the apex. On these convex portions the puncturation of the general surface is partially interrupted resulting in the elytra having a striate appearance which is most unusual in the genus. The punctures of the elytra are for the most part coarse, but with a confused and irregular intermingling of considerably less coarse punctures. In my tabulation of the section of *Heteronyx*, to which this species belongs (P.L.S., N.S.W., 1891, pp. 488-9) it falls beside *H. Froggatti*, Macl., from which it differs *inter alia* by the uniformly close rugulosity of its head.

S.A.; taken by Herr Koch near Lyndhurst.

ANACHEIROTUS (gen. nov. *Sericoidarum*).

Mas? Mentum quam latius longius, antice parum emarginatum; palpi labiales breves, articulo ultimo obconico; palpi maxillares modici, articulo ultimo cylindrico ad apicem truncato, quam penultimus multo longiori; labrum angustum valde transversum, late leviter arcuatum, vix prominulum, a clypei parte antica (hac fere ut *Haplopsis* subtus retrorsum obliquum) bene discreta; oculi magni sat distincte granulati, antice a cantho profunde incisi; antennæ (speciei typicæ) 9-articulatæ, clava 3-articulata articulis præcedentibus 4 conjunctis longitudine sat æquali; clypeus supra antice valde reflexus et late emarginatus (nonnihil ut *Haplopsis lineoligeræ*, Blanch., mas); prothorax transversus; elytra elongata nullo modo striata (stria subsuturali excepta); tibiæ anticæ extus obtuse leviter tridentatæ, posticis modice latis (fere ut *Haplopsis lineoligeræ*, Blanch.) sed pone medium fortiter transversim carinatis; tarsi breves robusti (quam tibiæ parum longiores); unguiculi valde bifidi; sterna sat glabra; coxæ posticæ quam metasternum parum breviores.

The small *Lamellicorn* for which I propose this new generic name is extremely difficult to place, as it combines the characters of very widely different genera. Its short stout tarsi are like those of the genus that I take to be *Ocnodus* (except in not being clothed beneath with tufts of long hair) from which it differs strongly in most other characters. Its clypeus and mouth organs suggest *Haplopsis*,—but there the resemblance ends. Its claws are those of a *Heteronyx* but its mouth organs and clypeus

(especially its extremely narrow,—almost linear,—non-prominent labrum) separate it widely from *Heteronyx*. In my tabulation of the Australian *Sericoid* genera (Tr. R.S., S.A., 1898, pp. 32-4) it must take its place beside *Heteronyx*,—which is perhaps its most natural position. To include it in the tabulation, the following must be substituted for line 25 on page 34 :—

FF. Form notably more convex.
  G. Labrum largely developed and prominent ... *Heteronyx*.
  GG. Labrum extremely narrow and not prominent .. *Anacheirotus*.

A. inornatus, sp. nov. Totus pallide testaceus; supra sparsim breviter pubescens, lateribus longe ciliatis; sat nitidus: clypeo crebre subtiliter, capite postice fortius minus crebre, prothorace fortiter sparsim, elytris quam prothorax magis crebre paullo minus fortiter, pygidio sparsim minus fortiter, punctulatis; clypei lateribus ante oculos fortiter angulatis; pronoto transverso, antice parum angustato, lateribus leviter rotundatis, angulis anticis leviter acutis posticis rotundatis. Long., 2 $\frac{4}{5}$ l.; lat., 1 $\frac{1}{5}$ l.

The clypeal canthus cuts into the eye to a little in front of its middle, and its lateral margin is strongly angular behind, the apex of the angle projecting a trifle beyond the outline of the eye.

S. Australia (Basin of Lake Eyre); taken by Herr Koch, near Farina.

ANOPLOGNATHUS.

A. concinnus, sp. nov. Mas? Sat brevis; minus convexus; nitidissimus; supra glaber, corpore subtus pygidioque sparsissime albido-pilosis; supra brunneo-castaneus plus minusve viridi-micans, corpore subtus obscure viridi vel cyaneo plus minusve violaceo-micanti, metasterno medio (exemplorum 2 visorum) splendide aureo, antennis palpis pedibusque castaneis; supra sparsim subtiliter punctulatus, elytris puncturis paullo majoribus lineatim leviter impressis, pygidio ad latera paullo magis perspicue punctulato; clypeo antice sat fortiter elevato-reflexo, rotundato; antennarum clava quam articuli præcedentes 5 conjuncti sublongiori; prothorace fortiter transverso, antice modice angustato leviter emarginato, postice fortiter bisinuato (lobo mediano haud emarginato), lateribus fere rectis, angulis anticis vix acutis posticis sat abrupte rectis; elytris ad apicem conjunctim late rotundatis; mesosterni processu elongato, acuto; tibiis anticis externe 3-dentatis, dentibus apicalibus 2 approximatis inter se, dente 3° (hoc paullo ante tibiam mediam sito) subobsoleto; unguibus ad apicem acutis haud fissis. Long., 6 $\frac{1}{2}$ l.; lat., 3 $\frac{1}{3}$ l.

This species is the smallest *Anoplognathus* yet described, being

a little smaller than *A. abnormis*, Macl., but otherwise does not appear to differ from its typical congeners, either structurally or in *facies*. In Sir W. Macleay's grouping of the *Anoplognathi* (Tr. E.S., N.S.W., II., pp. 353-4) it should be placed, I think, in the group containing *rugosus*, Kirby, *pectoralis*, Burm., and *dispar*, Macl., from all of which it differs widely *inter alia* by the subobsolete puncturation of its elytra.

N. Queensland; Mr. French.

BUPRESTIDÆ.

STIGMODERA.

In the Ann. Soc. Ent., Belg., 1898, there is a lengthy paper by M. Kerremans containing descriptions of a large number of new *Buprestidæ*, chiefly from Australia. Having recently been revising the *Stigmoderæ* of my own collection, and of the South Australian Museum, I have taken the opportunity to study M. Kerremans' late work somewhat closely as far as concerns the genus *Stigmodera*, and in the following notes I record the result, and add some remarks on certain other *Stigmoderæ*, together with the description of some new species.

S. triangulosa, Kerr. (*l.c.*)=*terræ-reginæ*, Blackb. (Tr. Roy. Soc., S.A., 1893, p. 295). It seems to me doubtful whether both these names will not have to be dropped in favor of *S. biguttata*, Macl. (Trans. Ent. Soc., N.S.W., I., p. 24)—a name that was applied to an insect which (judged by the description) might well be a variety of the species I (and subsequently M. Kerremans) described under the above names.

S. campestris, Kerr., nom. præocc. (Blackb, Tr. Roy. Soc., S.A., 1897, p. 31) I propose for it the name *subgrata*. In spite of its being, as M. Kerremans points out, extremely close to *S. grata*, Saund., the apical truncature of its elytra *inter alia* seems inconsistent with its being a mere variety.

S. sensitiva, Kerr. (*l.c.*)=*S. victoriensis*, Blackb. (Tr. Roy. S., S.A., 1890, p. 152).

S. laudabilis, Kerr. (*l.c.*). Judging by the description I should say this insect is *S. Skusei*, Blackb. (Tr. Roy. S., S.A., 1892, p. 46).

S. verax, Kerr. (*l.c.*). This species must be very close to (if not identical with) *S. Mastersi*, Macl. (Tr. Ent. Soc., N.S.W., II., p. 245).

S. colorata, Kerr, (*l.c.*), nom. præocc. (Hope, Tr. Ent. Soc., Lond., 1847, p. 283). I propose the name *dulcis* for this handsome species, of which there is a fine example in the S.A. Museum.

S. acuminata, Kerr. (*l.c.*). This species seems to be without doubt identical with *S. acutipennis*, Thoms.

S. placens, Kerr (*l.c.*). Evidently identical with *S. cara*, Blackb. (Tr. Roy. Soc., S.A., 1892, p. 216).

S. vigilans, Kerr. (*l.c.*). I have before me specimens from Victoria (M. Kerremans' locality) which agree very well with the description of this species. They appear to me, however, to be merely a variety of *S. rectifasciata*, Saund.

S. consularis, Kerr. (*l.c.*).=*S. guttaticollis*, Blackb. (Tr. Roy. S.A., 1892, p. 157).

S. addenda, Kerr. (*l.c.*). I can find nothing in the description of this insect to distinguish it from *S. pallidipennis*, Blackb. (Tr. Roy. Soc., S.A., 1890, p. 154). *Addenda*, moreover, is a nom. præocc. (Thoms. Typ. Bupr., 1878, p. 52).

S. bucolica, Kerr. (*l.c.*). The description of this species does not indicate any difference from *S. Sieboldi*, L. and G.

S. tacita, Kerr. (*l.c.*). The habitat of this species is given merely as "Australia." I have examples from Eyre's Peninsula of a *Stigmodera* that agrees very well with the description, and which I have regarded doubtfully as a variety of *S. Kirbyi*, Guér., but on reconsideration I think it is a good species.

S. ocularis, Kerr. (*l.c.*). I cannot find anything in the description of this insect to distinguish it from *S. lilliputana*, Thoms.

S. mansueta, Kerr. (*l.c.*) The habitat given is merely "Australia." I have specimens from W. Australia which fit the description very satisfactorily.

S. crocipennis, Hope (Bupr., p. 6). This species seems to be generally regarded as identical with *S. rufipennis*, Kirby. It appears, however, to me to be more probably the allied *S. parallela*, Saund.

S. dawsonensis, Blackb. In Tr. Roy. Soc., S.A., 1892, p. 220, I expressed a doubt whether this might not prove to be an extreme variety of *S. lilliputana*, Thoms. It is, however, a good species.

S. tasmanica, Kerr. (C.R. Soc. Ent. Belg., 1890, p. 2). This insect is certainly I think one of the innumerable varieties of *S. Stricklandi*, Hope, of which I have many specimens from Hope's locality (Morialta, near Adelaide), and also from Tasmania and other localities in Southern Australia. Lightly coloured examples agree with Hope's description in having flavous elytra each marked with a dark spot, below the shoulder a median dark fascia, and a large dark blotch filling the apical one-fourth of the elytra and bearing a small reddish or yellow spot in its middle. There is a still lighter variety in which the spot in the dark apex is much enlarged, and another in which it becomes a fascia cutting off a dark fascia from the front of the apical dark blotch. Other specimens are darker than the type,—the subhumeral dark spot enlarging till it becomes a fascia and

the median fascia becoming more or less wider than in the type. These last-named examples agree with the description of *tasmanica* in having the elytra dark violaceous with three pale fasciæ. I have specimens of the above forms taken in company quite promiscuously, from Tasmania as well as S. Australia, Victoria, and Southern N.S. Wales. Whether this insect is identical with *S. Mitchelli*, Hope, appears to me very doubtful in spite of Mr. Saunders' assertion of its identity, for he says that *Mitchelli* has elytra unarmed at the apex (which is not the case with the present species) and Hope mentions a fovea on the pronotum near the hind angle which is not to be found in the present insect. The type of *S. Mitchelli* was from W. Australia, and I have not seen *S. Stricklandi* or anything like it from that colony. *S. Stricklandi* may be distinguished from all the other hitherto described *Stigmoderæ* as follows: apex of elytra truncate and feebly bi-acute, prothorax dark with lateral margins pale, under surface dark (except sides of prothorax and of abdomen and sometimes a spot on the hind coxæ), elytra having transverse zones of dark and pale colouring (more than two zones pale, the apex dark) their interstices moderately convex and their apical points feeble, head scarcely concave longitudinally. All the numerous varieties (that I have seen) of *Stricklandi* are covered by the above description, and I know of no other species that it will fit.

S. ostentatrix, Thoms. This insect is very near *Stricklandi*, but is a good species, differing by, *inter alia*, its strongly costate elytral interstices and strong sutural spine at the apex of its elytra, as well as in the colouring of its prothorax. I have a fine example of it in my collection, but do not know its exact habitat, which seems to have been unknown to M. Thomson also; there is an example also in the S.A. Museum marked "W.A.?"

S. Karattæ, Blackb. In Tr. Roy. Soc., S.A., 1890, pp. 149-50, I pointed out the distinctions of this species from *S. Stricklandi* (which I called *S. Mitchelli* on Saunders' authority, though I now doubt the identity.) If *S. Mitchelli* be distinct from *S. Stricklandi*, *Karattæ* is still distinct from *Mitchelli*, being very differently marked and coloured from the type and (even if *Mitchelli* prove to be variable in colour and markings) differing also, *inter alia*, in the absence of a fovea near the hind angles of the pronotum.

S. rugosipennis, Thoms., Arch. Ent., 1857, p. 111. This seems to be clearly a synoym of *S. obscuripennis*, Mann. Bull. Mosc., 1837, p. 32. I believe this synonymy has hitherto escaped notice.

S. Carpentariæ, Blackb. This seems to be the insect referred to by Mr. Waterhouse [Ann. Nat. Hist. (s) VII.] as a local form

of a specimen previously mentioned by him as a var. of *S. viridicincta*, Waterh. (Tr. Ent. Soc., Lond., 1874, p. 543.) I have not seen the var.? last named, but am quite satisfied that *S. Carpentariæ* is distinct from *S. viridicincta*, as it differs not only in colouring and pattern (which are very widely distinct) but in numerous other characters also, *e.g.*, its prothorax notably more strongly transverse, the striæ of its elytra more closely punctured, the extero-apical tooth of its elytra less acute.

S. elegantula, White (Stoke's Journ., I., p. 507.) Its author, after describing this species, says "near *coccinata*, Hope." I cannot find any difference at all in the two descriptions indicating that they are not founded on one and the same species. Hope, it is true, calls the antemedian mark on the elytra a spot (not reaching the suture) whereas according to White it is a fascia narrowed by a deep notch before reaching the suture, but there are so many species of *Stigmodera* in which an antemedian dark marking consists of a fascia liable in varieties to be broken up into isolated spots that no specific value can be attributed to the character, and I can find no other to fall back upon. The species is a very distinct one, with no close allies as yet described.

S. Pascoei, Saund. This magnificent insect is stated by its author to occur in "Australia," without the mention of any more exact habitat. I have seen an example in the collection of Mr. W. W. Froggatt, which was taken at Kalgoorlie, in Western Australia.

S. cærulea, Kerr. In Mem. Soc. Ent. Belg., 1892, M. Kerremans proposes this name as a substitute for the nom. præocc. *cœlestis*, Kerr. I, however, had in 1890 (Tr. R.S., S.A., p. 148) proposed the name *stillata* for it.

S. flavescens, Masters (*flava*, Thoms.). M. Kerremans (Mem. Soc. Ent., Belg., 1892, p. 148) makes this identical with *S. flava*, Saund. The latter species I am familiar with, and it is correctly described as having the apex of each elytron rounded. *S. flavescens* is described as having the apex of each elytron bidentate. Unless Thomson's description is actually incorrect the two can hardly be identical.

S. capucina, Blackb. I find that this is a nom. præocc. having been used by Thomson (Rev. and Mag. Zool., 1856, p. 46) for an insect that appears to be identical with *decipiens*, Westw. However, I subsequently (Tr. R.S., S.A., 1894, p. 141) described under the name *Caroli* a *Stigmodera* which I was eventually satisfied must be regarded as a var. of my *capucina* (*l.c*, 1897, p. 31) and consequently *Caroli* becomes the name of the species that I originally named *capucina*.

S. carinata, Macl. M. Kerremans (Mem. Soc. Ent., Belg., 1892, p. 145) gives this name as a synonym of *S. plagiata*, Gory.

I have before me several examples of Macleay's insect, and am inclined to think them distinct from *plagiata* though undoubtedly very close to it. The form of the common apical dark blotch on the elytra seems constantly different,—in *carinata* filling the whole apex (its front margin on each elytron a more or less sinuous line running from the suture obliquely hindward and outward to the lateral margin), while in *plagiata* it does not fill the whole apex but is a square spot the front margin of which runs out transversely towards the lateral margin of the elytron, and at a considerable distance from it meets (at a right angle) the lateral margin (of the spot) which runs hindward as a straight line parallel to the suture to join the lateral margin of the elytra, reaching it at a very short distance from the apex (of the elytra). In *plagiata* but not in *carinata* the lateral margin of the elytra is of a red colour distinctly brighter than the colour of other parts of the surface, and the pronotum of *carinata* is evidently more gibbous than that of *plagiata* with the central longitudinal line considerably more strongly impressed.

S. insignicollis. sp. nov. Sat elongata; minus lata; pone medium minus fortiter dilatata; sat nitida; supra glabra, subtus pilis minus brevibus albidis plus minusve dense vestita; splendide aureocuprea (nonnullis exemplis plus minusve viridi-micantibus) prothoracis macula magna discoidali (hoc basin nec apicem attingenti) læte violacea; elytris rufo-auarantiacis notas cyaneo-nigras præbentibus [sc. fascia postbasali angusta margines laterales haud attingenti (hac exemplorum nonnullorum in maculas 2 vel 3 divisa), fascia mediana curvata (antrorsum convexa), et macula communi præapicali (hac formam variabili) cum fascia mediana secundum suturam connexa vel haud connexa]; capite sat brevi, crebre subgrosse punctulato, longitudinaliter concavo; prothorace quam longiori ut 7 ad 5 (postice quam antice ut 6½ ad 4) latiori, in parte violaceo sparsius subfortiter nec rugulose (in parte cetera fortiter rugulose confluenter) punctulato, lateribus arcuatis juxta basin sinuatis, angulis omnibus acutis, basi sat fortiter bisinuata; elytris striatis, striis punctulatis, interstitiis sat fortiter convexis sat fortiter (ut striæ) punctulatis, apice oblique emarginatis, parte emarginata externe quam ad suturam multo magis fortiter acuminata, lateribus postice subtiliter crenulatis. Long., 6—8½ l.; lat., 2⅕—3⅕ l.

The most distinctive character of this species consists in the very remarkable colouring and sculpture of the prothorax. The disc is occupied by a large violaceous spot (which, however, does not reach the front margin) on which the puncturation is smooth and not close, while the rest of the surface is of a brilliant golden

copper colour, and is coarsely and confluently rugulose. The pattern on the elytra (apart from colour) resembles roughly that of *S. cyanicollis*, Boisd., as figured by Mr. Saunders (*loc. cit.*) but the fasciæ or spots are not connected by dark colouring on the suture, except in occasional examples having the median fascia and præapical spot connected. In some specimens, however, the three spots placed transversely across the sub-basal part of the elytra are narrowly confluent so as to form a fascia, and the shape of the common præapical spot varies from circular to semi-circular.

W. Australia (taken near Cue by Mr. Ellershaw).

S. quadrifasciata, Saund. I met with a few specimens (evidently identical with the insect on which this species was founded) in Central Australia on the flowers of a small shrub (unknown to me by name) near the Cecilia Creek. It is a variable species, both the basal and subapical fasciæ of the elytra having a tendency to break up into isolated spots placed in a transverse row. In Saunders' description the colour of the abdomen is given as "olivaceous" as distinguished from the cyaneous remainder of the under surface, while in my three examples the under surface is uniformly cyaneous, but as in all other respects my examples agree absolutely with the figure and description (allowing for the variation in the elytral pattern in two of them as noted above) I have no doubt the recorded colouring of the abdomen is either sexual or occasional.

S. rubriventris, sp. nov. Modice elongata, minus convexa, pone medium modice dilatata; sat nitida; supra glabra, subtus sparsim argenteo-pilosa; ænea, elytris rufis notas cyaneas præbentibus [sc., maculas 3 postbasales transversim positas (e his mediana communi late ad basin producta, his in exemplis nonnullis fere confluentibus), fasciam postmedianam integram cum macula postbasali mediana anguste in sutura connexam, et maculam apicalem communem subtriangularem (hac cum fascia postmediana anguste in sutura connexa et ad apicem summam dilatata)], antennis pedibusque violaceis, abdomine rubro ad basin ænescenti; capite sat brevi, crebre fortiter punctulato, longitudinaliter concavo; prothorace quam longiori (et postice quam antice) ut 12 ad 7 latiori, crebre sat fortiter (ad latera subrugulose) punctulato, in medio anguste interrupte longitudinaliter lævi, lateribus pone medium fortiter dilatato-rotundatis, angulis anticis acutis posticis rectis, basi leviter bisinuata; elytris striatis, striis subtiliter punctulatis, interstitiis antice parum (postice fortiter) convexis sparsim (latera versus magis crebre) punctulatis, ad apicem acuminatis haud (vel oblique vix manifeste) emarginatis, lateribus haud crenulatis; unguiculis modicis fortiter divergentibus. Long., 6½ l.; lat., 2½ l.

In one of the two specimens before me the lateral two of the three postbasal elytral spots are widely separated from the median spot; in the other specimen they are all but confluent with it; I have no doubt these spots are liable to become a fascia. The apical spot is a triangle with its apex at the apex of the elytra, but its extreme apex is dilated so as to cover narrowly the whole elytral apex. The postmedian fascia is notably wider in one specimen than the other; it crosses the elytra at right angles to the suture and (in that sense is straight, but) its margins are sinuous. Among the species having the head and prothorax of uniformly dark colour the elytra red with three zones of dark colouring, the abdomen uniformly red except base, and the apex of the elytra not distinctly emarginate; the present species is recognisable by the following characters in combination, —size not less than 4½ l. nor more than 9½ l., elytra separately acuminate at the apex.

W. Australia; sent to me by Mr. French.

S. insignis, Blackb. In the diagnosis of this species (Tr. Roy. Soc., S.A., 1892, p. 217, line 3 of the diagnosis) "ante basin" should be "ante apicem." "Ante basin" being of course nonsense, and the term "subapical" in the remarks following the diagnosis being evidently applied to the same marking that *ante basin* is applied to in the diagnosis, probably any reader would discern that *ante basin* must be a *lapsus calami*, but it is better to draw attention to it here.

S. filiformis, Blackb. In the diagnosis of this species (Tr. Roy. Soc., S.A., 1892, p. 218, line 8) for "suture" read "lateral margin."

S. cincta, Blackb. (*rubrocincta*, Kerr., nom. præocc). "Australia" is the habitat attributed to this species. I have an example from W. Australia.

S. obesissima, Thoms. (Typ. Bupr., App. I., 1879, p. 32), is clearly a synonym of *S. Saundersi*, Waterh. (Ann. N.H., 1876, p. 70). This synonymy has not been previously recorded.

S. flavipennis, Géhin. My collection and that of the S.A. Museum contain specimens of what I take to be this insect. They vary into a form which is possibly *S. elegans*, Géhin,—though none of them quite agree in markings with the figure of the latter insect. They are certainly not varieties of *S. Yarrelli*, L. and G. (as *flavipennis* and *elegans* are said to be) from which —disregarding the totally unlike colouring of their elytra—they differ by the presence of long white hairs on their head and thickly clothing their sterna, as well as by the very much closer puncturation of their prosternal process. There is a doubt, it is true, about the identity with *flavipennis* of the specimens before me because the pilosity of their sterna is quite dense, whereas

Géhin speaks only of "quelques poils rares;" because their form is notably shorter and wider than the form of *Yarrelli*, while Géhin seems to say that *flavipennis* is "narrower and longer than *Yarrelli*,—but it is not quite clear he may not mean that *Yarrelli* is narrower and longer than *flavipennis* (which is the more likely since *Yarrelli* is a particularly narrow and elongate species); and because their sterna and hind coxæ are variably (but always considerably) variegated with yellow, whereas in *flavipennis* they should be entirely green. The last-named discrepancy is of less consequence inasmuch as Géhin's description is evidently carelessly written containing the statement that the "ventre et bords postèrieurs des segments abdominaux" are of a beautiful green colour. The ventral segments of the specimens before me are yellow, with their (except the apical one) hindmargins green. Géhin says that *S. flavipennis* is allied to "*Yarrelli* and *flavipennis*" (the latter name obviously a misprint). The species I am discussing (and for which I claim the name *flavipennis*, Géhin, until the claim may be shown erroneous by an inspection of Géhin's type) is smaller than *Yarrelli* (Long., 9—10 l.) and notably less narrow and elongate. Its under surface and legs are considerably more closely punctulate, its sterna quite densely clothed with long white hairs. Its head is pilose, the sutural apex of its elytra bears a distinct (though not long or very sharp) spine limiting a distinct (though feeble) truncation of the apex of each elytron. Its colours and markings are very similar to those of *Yarrelli* except on the elytra where they are quite different. The elytra vary from uniform reddish testaceous (except the extreme base) to a form in which there is a small common sutural cyaneous spot a little behind the scutellum, a row of four cyaneous spots placed transversely (two on each elytron) slightly behind the middle and a narrow cyaneous edging of the apex. The insect is found in S.W. Australia. It is to be noted that in the type of *Yarrelli*, Hope (as described by Mr. Saunders, Tr. Ent. Soc., Lond., 1868, p. 32), and in examples in my collection the apex of the elytra is simply rounded, while in other specimens before me (otherwise indistinguishable) the apex of the elytra is slightly truncated and the apex of the suture is slightly produced (though less so than in *flavipennis*).

S. elegans, Géhin. This insect (referred to above as possibly identical with *flavipennis*, Géhin) is more probably, I think, a distinct species that I have not seen. I cannot understand its being called a variety of *Yarrelli* as no variety of the latter (observed by me,—and I have seen many) much resembles it in markings, and the size (12—13 mm.) greatly increases the difficulty of supposing it to be *Yarrelli*. Its author mentions having seen a good many specimens and the varieties he indicates are

still less than the type like *Yarrelli*. Its markings come nearer those of *S. bifasciata*, Saund., than of any other *Stigmodera* known to me, but it is certainly not that species.

EUCNEMIDÆ.

NEOLYCAON (gen. nov.)

I propose this name as a substitute for *Lycaon*, Bonvouloir (Ann. Soc. Ent. Fr., 1875), my attention having been called by Mr. T. S. Hall, M.A. (of Melbourne University) to its being a *nom. præocc.* in Zoology, owing to its use for *Mammalia* by Brookes (I see Scudder gives it "Smith") in 1827.

ELATERIDÆ.

LACON.

L. Victoriæ, Cand. In Pr. L.S., N.S.W., 1891, p. 508, I doubtfully attributed to this species an insect occurring near Melbourne, the doubt arising from its antennæ being testaceous or reddish in colour, whereas the description seemed to me to imply their being of darker colour. Subsequently Dr. Candéze sent me a specimen as his *Victoriæ*, which is identical with the insect I called by the name.

L. farinensis, sp. nov. Sat latus; sat opacus; piceo-ferrugineus, pronoti angulis posticis et elytrorum marginibus (sutura excepta) plus minusve rufescentibus; supra setis pallidis brevibus crassis sat crebre vestitus; capite pronotoque sat crebre sat fortiter punctulatis; hoc quam in medio longiori vix latiori, sat fortiter convexo (a latere viso), lateribus a basi sat longe ultra medium leviter subsinuatim divergentibus (hinc ad apicem fortiter convergentibus); elytris quam prothorax ut 9 ad 5 longioribus, subobsolete punctulato-striatis, interstitiis planis biseriatim (quam striæ haud magis subtiliter) punctulatis plus minusve distincte granulatis vel rugulosis,—epipleuris adversus abdominis basin recte truncatis; coxis posticis in medio subito fortiter angustatis; sulcis ad tarsos recipiendos in prosterno metasternoque sat fortiter impressis nec (ut *L. caliginosi*, Guer., sunt) bene definitis. Long., $2\frac{2}{3}$—$3\frac{1}{5}$ l.; lat., 1—$1\frac{1}{5}$ l.

A very distinct little species; the following characters in combination distinguish it from all its described Australian congeners:—Tarsal sulci on sterna very distinct but not sharply cut, front part of epipleuræ narrowed opposite the hindmargin by a straight truncation, hind coxæ suddenly and strongly narrowed about halfway between their base and the lateral margin of the body, elytra much longer than but less than twice as long as the prothorax, the punctures of the elytral striæ not larger

than those of the interstices, antennæ of pale-ferruginous colour, elytral margins pale-ferruginous and the interstices granulous or rugulose, upper surface set with short coarse pale setæ, size very small. The prothorax to a casual glance looks longer than wide but by measurement the length down the middle line is slightly less than the greatest width. The nearest allies of this species are, I think, *L. duplex*, Blackb., and *Victoriæ*, Cand., from both which it differs *inter alia* by its colour and the strong rugulosity of its elytral interstices.

S.A.; Lake Eyre basin; taken by Herr Koch at Lyndhurst, near Farina.

RHIPIDOCERIDÆ.

ENNOMETES.

E. (Callirrhipis) ruficornis, Gray. Some years ago I took, in the Blue Mountain district of N.S.W., a species which seems to be the very briefly described *Callirrhipis ruficornis*, Gray. It is however quite clearly a member of Pascoe's genus *Ennometes* (which seems to me worthy of being considered really distinct from *Callirrhipis*). I can find no character to distinguish as species *E. Lacordairei*, Pasc., and *C. ruficornis*, Gray, nor does the insect before me differ from either description except in being somewhat larger than the specimen described by Pascoe (Gray does not mention the size of his species). As Pascoe makes no reference to *C. ruficornis* it seems not unlikely that he overlooked it, and I suspect that *Callirrhipis ruficornis* and *Ennometes Lacordairei* are identical, in which case the insect must stand as *Ennometes ruficornis*, Gray.

RHIPIDOCERA.

R. mystacina, Fab. Mr. Waterhouse (Tr. E.S., Lond., 1875, p. 202) describes the typical specimen of this insect and mentions that examples from Northern Queensland are quite identical with it. He then mentions what he calls the "common form" which he says has the prothorax spotted (not evenly clothed) with white pubescence as being in his opinion a variety of *mystacina*. I have before me specimens of typical *mystacina* from N. Queensland and also examples with spotted prothorax from Tasmania, Victoria, and S. Australia. These do not appear to differ *inter se* except in the Tasmanian specimens being larger than those from the mainland. They are decidedly *R. femoralis*, Kirby (which was described from a small island close to Tasmania) and are certainly a good species differing from *mystacina* (apart from the vestiture of the prothorax) by *inter alia* the darker colour of their derm and the notable sinuation of the sides of their prothorax (the same in *mystacina* being nearly straight).

MALACODERMIDÆ.

TRICHALUS.

In Tr.R.S., S.A., 1894, I expressed the opinion that the genus *Trichalus* cannot be maintained as distinct from *Metriorrhynchus*. In Proc.L.S., N.S.W., 1898, Mr. Lea concurs with this view but seems to think that it is desirable to use the name as a matter of convenience because the distinction between the two forms is easily recognisable (the subsutural elytral costa in *Trichalus* becoming obsolete at a short distance behind the base, while in *Metriorrhynchus* it is similar to the other costæ). I think there is something to be said in favour of that proposition, as both forms are very numerous in Australia, and to treat them as generically distinct certainly simplifies the task of identifying and describing them. Accepting the name *Trichalus* on the above grounds, I offer the following notes.

T. (Metriorrhynchus) semicostatus, Blackb. *Trichalus* being regarded as a genus this species must be referred to it. *T. Raymondi*, Lea, must be somewhat close to it, and was taken in the same region (the Australian Alps). Probably however it is distinct, as *Raymondi* is said to have the median line of the head distinct, the antennæ of the male not reaching to the middle of the elytra and the rostrum tinged with red at the apex, whereas in *semicostatus* there is no distinct median line on the head, the antennæ of the male would certainly reach back to the middle of the elytra and the rostrum is entirely black. If the two names should prove to refer to the same insect my name has the priority.

T. funereus, sp. nov. Niger, elytrorum apice testaceo; rostro nullo; prothoracis areola discoidali lanceolata bene definita; elytris costis longitudinalibus discoidalibus integris 3 et alia subsuturali postice abbreviata instructis (his inter se æqualibus), interstitiis biseriatim areolatis (series lineis subtilibus continuis separantur); antennis quam corporis dimidium sat longioribus, sat compressis, articulo 4° quam 3us parum longiori. Long., $4\frac{1}{5}$ l.; lat., $1\frac{1}{2}$ l.

Its colouring (entirely black except the testaceous apex of the elytra) *inter alia* distinguishes this species from all its described Australian congeners. The only one of them in which the prothorax is black and the elytra not entirely red is *T. discoideus*, Er., of which Mr. Waterhouse mentions a form (in his opinion a variety) coloured like the present insect except in having the suture of the elytra red. The description of that species, however, calls the prothorax "antrorsum angustatus," which would not apply satisfactorily to this species as its prothorax is scarcely at all narrower in front than behind. Moreover I have a

Trichalus from Tasmania (Erickson's locality) which I believe to be *discoideus* and from which the present insect differs *inter alia* by the very much larger areolæ into which its elytral interstices are divided; they are like those of *Metriorrhynchus (Stadenus) inquinulus*, Waterh.

Victoria; Dividing Range.

T. distinctus, Lea. The description of this species scarcely differs from that of *T. ampliatus*, Waterh., and both descriptions might well be founded on the same insect as *Lycus ochraceus*, Dalm.

METRIORRHYNCHUS.

M. insignipennis, sp. nov. Mas. Totus niger; prothorace 7-areolato; rostro fere nullo; elytris costis longitudinalibus 4 instructis; hæ costæ costulis transversis numerosis bene definitis inter se junctæ sunt, ita ut in utroque elytro areolæ quadratæ longitudinaliter 5-seriatim positæ sunt; antennis corporis dimidio longitudine sat æqualibus, sat fortiter compressis, articulis omnibus (basali 2° que exceptis) quam latioribus plus minusve longioribus, articulo 3° 4° æquali. Long., $3\frac{3}{4}$—4 l.; lat., 1 l.

Although the rostrum is very short it cannot be called quite non-existent, the distance from the base of the antennæ to the base of the maxillary palpi being not much shorter than the length of one of the latter. The elytra have each four discal costæ without any trace of intermediate elevated longitudinal lines,—so that the sculpture of each elytron may be said to consist of five rows of well-defined areolæ separated from each other by longitudinal costæ of which the second is the most conspicuous. This sculpture is suggestive of Mr. Waterhouse's genus *Xylobanus* but the costulæ connecting the elytral costæ are not uniformly transverse; they resemble those of *M. scalaris* as figured by Waterhouse (Tr.E.S., Lond., 1877, Pl. I., fig. 56) and in any case *Xylobanus* does not appear to me capable of being maintained as more than a section of *Metriorrhynchus*. The second joint of the antennæ is scarcely visible.

Tasmania.

M. atratus, Fab. Fem. Totus niger; prothorace 7-areolato; rostro fere nullo; elytris costis longitudinalibus discoidalibus 4 instructis, interstitiis biseriatim indistincte areolatis (series lineis indistincte,—antice magis distincte,—elevatis separantur); antennis quam corporis dimidium sat brevioribus, sat fortiter compressis, articulis 3° 9° quam latioribus vix vel haud longioribus, 10° quam latiori multo longiori quam 9us multo angustiori. Long., $4\frac{1}{2}$ l.; lat., $1\frac{1}{3}$ l.

Very near *M. hæmorrhoidalis*, Er., of which I should be dis-

posed to consider it a colour var. with the elytral sculpture accidentally wanting in distinctness were it not for the very evident difference in the antennal structure,—the penultimate joint being very much narrower than the antepenultimate and not much less than half again as long as wide, while in the same sex of *hæmorrhoidalis* the penultimate joint is scarcely narrower than the antepenultimate and is scarcely if at all longer than wide. As *Lycus atratus*, Fab., is very insufficiently described and there cannot be much doubt of this Tasmanian *Metriorrhynchus* being identical with it I have thought it desirable to describe it fully.

Tasmania.

M. cliens, sp. nov. Fem. *M. clientulo*, Waterh., affinis; niger, in elytrorum partibus tribus anticis ruber; prothorace 5-areolato; rostro nullo; elytris costis longitudinalibus discoidalibus 4 instructis (his inter se sat æqualibus), interstitiis biseriatim areolatis (series lineis subtilibus elevatis separantur), sculptura basin—et præsertim apicem—versus quam in medio magis perspicua; antennis quam corporis dimidium vix longioribus, sat fortiter compressis, articulis 4°—9° quam longioribus sat latioribus, articulo 3° quam 4us sat longiori. Long., 4 l.; lat., $1\frac{1}{3}$ l.

Easily distinguishable from most of its congeners by the surface of its pronotum being divided into five areolæ, of which the two antero-lateral ones are coarsely punctulate. Differs from *M. clientulus*, Waterh., *inter alia* by the four principal elevated lines on the disc of its elytra being equal *inter se*, and the hind angles of its prothorax not produced outward.

N.S.W. (Tweed R.).

M. flagellatus, sp. nov. Mas. Niger, elytris rufo-testaceis; prothorace 7-areolato; rostro elongato (tibiæ anticæ longitudine sat æquali); elytris costis longitudinalibus discoidalibus 4 instructis (his inter se plus minusve æqualibus), interstitiis biseriatim perspicue et regulariter areolatis (series lineis subtilibus elevatis bene definitis separantur); antennis quam corporis dimidium vix longioribus, sat fortiter compressis, articulis 3°—10° longe flabellatis, flabellis haud serratis (ut ea *M. gigantis*, Blackb., sunt), articuli 3^{i} flabello ultra articuli 5^{i} basin producto. Long., 7 l.; lat., $1\frac{4}{5}$ l.

The long slender rami into which the antennal joints of the male are produced distinguish this species from all the other described Australian members of the genus (except *gigas*, Blackb.) having similar colouring (entirely black except the entirely red elytra). From *gigas* it differs by its narrower and more elongate form, the distinctly *testaceous* tone of colour on the elytra, the tendency of the elytral costæ to become feebler towards the apex, the narrower prothorax (especially in proportion to the width of

the head), and the non-serrate outline of the antennal rami. The antennæ resemble those of *M. cinctus*, Waterh.

N.S. Wales; taken by Mr. Froggatt near Yass. (His. No. 44.)

M. miles, sp. nov. Mas. Niger, elytris rufis; prothorace 7-areolato; rostro fere nullo; elytris costis longitudinalibus discoidalibus 4 instructis (his inter se sat æqualibus), interstitiis biseriatim areolatis (series lineis subtilibus distinctis, —his basin versus quam costæ vix minus elevatis,—separantur); antennis quam corporis dimidium brevioribus, fortiter compressis, articulis 3° leviter,—4°—10° valde transversis, 4° quam 3us paullo breviori. Long., 5 l.; lat., 1$\frac{3}{5}$ l.

This species would be reckoned, I think, by Mr. Waterhouse a true *Metriorrhynchus*. It differs from all the species resembling it in respect of colour (except *rufipennis*, Fab., and *brevirostris*, Waterh.), by its having scarcely any rostrum. From *rufipennis* (=*salebrosus*, Waterh.) it differs *inter alia* by its still shorter and wider rostrum, by the much shorter and wider joints of its antennæ, by the obtuse hind angles of its prothorax, and by the much more distinct lines separating the interstitial areolets of its elytra which in the front might be called intermediate costæ. *M. brevirostris*, Waterh., has a diagnosis of only three words, and the appended note merely states that the insect differs faom *erythropterus*, Er., by "the rostrum shorter, scarcely longer than broad." In the present species the rostrum is very much broader than long.

Victoria; Dividing Range.

M. mentitor, sp. nov. Fem. Niger, prothoracis elytrorumque lateribus anguste, et horum apice sat late, rufis; rostro fere nullo; prothorace 7-areolato; elytris costis longitudinalibus discoidalibus 4 instructis (his inter se sat æqualibus), interstitiis biseriatim areolatis (series lineis subtilibus sat manifestis separantur); antennis quam corporis dimidium vix brevioribus, fortiter compressis, articulis 3°—10° quam longioribus vix latioribus, 3° 4° que longitudine sat æqualibus. Long., 6 l.; lat., 2 l.

Near *M. cœnosus*, Lea, but differing by the hind angles of the prothorax quite obtuse the lines separating the areolæ of the elytral interstices very distinct in almost their whole length (a little obscure only in the middle of their length) and the considerably larger size of the insect; also in the antennæ and legs entirely black. In colour (except in the red edging of its prothorax), general build, and elytral sculpture, remarkably like the insect that Mr. Waterhouse described as *M. inquinulus*, but subsequently (on the ground of its peculiar prothoracic areolation) placed in his genus *Stadenus*. According to Mr. Waterhouse's

arrangement of the Australian *Lycides* this is a true *Metriorrhynchus*.

Victoria; Dividing Range.

M. paradoxa, sp. nov. Mas. Niger, elytrorum apice sat late et margine externo (parte antica excepta) anguste rufis; pro thorace 7-areolato; rostro nullo; elytris costis longitudinalibus discoidalibus 4 (his inter se æqualibus) instructis, costis lineis recte transversis (his ut costæ æqualiter elevatis) conjunctis; antennis quam corporis dimidium paullo longioribus, sat fortiter compressis, articulis omnibus (2° excepto) quam latioribus longioribus, articulo 3° quam 1us duplo longiori, 3°—11° longitudine sat æqualibus modice serratis. Long., 4 l.; lat., $1\frac{2}{3}$ l.

The well defined seven areolæ of the prothorax together with the remarkable elytral sculpture render this species easy to recognise. It does not appear to fall into any of the subgenera that Mr. Waterhouse has formed at the expense of *Metriorrhynchus*. Each longitudinal costa on the elytra is connected with that next to it by a regular series of perfectly transverse short costæ of the same elevation as the longitudinal costæ, and there is no trace whatever of intermediate longitudinal lines. Mr. Waterhouse would perhaps place this insect in his genus *Xylobanus*.

Victoria; Dividing Range.

M. eremita, sp. nov. Mas. Niger, prothoracis lateribus margineque antico et elytrorum sutura (anguste) margine laterali (sat late) apiceque (vix in parte elytrorum septima) testaceo-rufis; rostro latiori quam longiori; prothorace 7-areolato; elytris costis longitudinalibus discoidalibus 4 (his fortiter cariniformibus inter se æqualibus) instructis, interstitiis biseriatim areolatis (quam *M. erythropteri*, Er., manifeste minus grosse, præsertim in parte mediana; series lineis subtilibus elevatis sat continue separantur); antennis quam corporis dimidium paullo longioribus, sat fortiter compressis, articulo 3° quam 4us vix longiori, articulis 3°—10° sat fortiter serratis, parte producta quam articuli pars cetera parum breviori.

Fem. antennis minus fortiter serratis. Long., 5—$6\frac{1}{2}$ l.; lat., $1\frac{2}{3}$—2 l.

Rather closely allied to *M. monticola*, Blackb., and *marginipennis*, Lea; from the former it differs *inter alia* by the much less coarse sculpture of the intervals between the elytral costæ; from the latter by *inter alia* the discoidal costæ of the elytra being similar *inter se* and the structure of the antennæ. There is evidently something wrong in the numbering of the joints in the description of the antennæ of *marginipennis* of which it is

stated that the "second joint is concealed and the third slightly longer than the second, second to tenth subequal, eleventh elongate." I suspect this means that the fourth is slightly longer than the third, but it certainly cannot mean that the third is if anything longer than the fourth, which is the case in the species before me. The colouring of this insect (quite constant in all the examples I have seen) also differs from that of the two species with which I am comparing it, the black discal patch on the elytra extending from the inner margin of the external elytral costa to the outer margin of the sutural carina, and leaving the apex red for the length of scarcely one-seventh part of the length of the elytra. The intermediate longitudinal elevated lines on the elytra are strongest near the base (where they are scarcely different from the costæ) and are distinctly traceable nearly to the apex. This insect might be suspected of being a variety of *M. lineatus*, Waterh., but *inter alia* its antennæ are incompatible, for in the male they resemble those of *inquinulum*, Waterh. (same sex), as figured by Mr. Waterhouse; while those of *lineatus* (male,—not figured by Waterhouse) are like Mr. Waterhouse's figure of the antennæ of *Trichalus flavopictus*, Waterh.

Victoria; Dividing Range.

M. rufipennis, Fab. I have little doubt that Mr. Waterhouse is right in thinking (though he is not very confident on the point) that his *salebrosum* is identical with Fabricius' species.

M. marginatus, Er. I should say there is no doubt that *M. hæmorrhoidalis*, Waterh., is identical with this species. I cannot however agree with Mr. Waterhouse (Typ. Br. Mus., Lyc.) that his *hæmorrhoidalis* may be a colour var. of *rufipennis*, Fab. The two are unquestionably closely allied apart from colour; but there is a very marked difference in the antennæ, the produced piece of each joint beginning with the sixth being in *rufipennis* very much more slender than in *hæmorrhoidalis* (= *marginatus*, Er.).

CALOCHROMUS.

C. cucullatus, sp. nov. Sat elongatus; modice convexus; sat nitidus (elytris exceptis); elytris pubescentibus; niger, elytrorum margine laterali et parte postica tertia læte rufis; labro antice emarginato; antennarum articulis 3° 4° que longitudine sat æqualibus; capite antice profunde sulcato; prothorace fortiter transverso, antice parum angustato, lateribus modice arcuatis, angulis anticis valde obtusis posticis (superne visis) fere rotundatis, disco medio profunde longitudinaliter sulcato, sulci lateribus valde gibbis (præsertim postice), disci parte postero-externa valde obtuse tumido, basi parum manifeste bisinuata; elytris costis

modicis discoidalibus 4 instructis, parte inter suturam costamque subsuturalem in dimidia parte antica sat distincte carinata, interstitiis subtilissime granulosis.

Maris clypeo antice profunde trifido, processu intermedio spiniformi suberecto; femoribus anticis incrassatis; segmento ventrali penultimo in medio emarginato.

Feminæ clypeo antice minus profunde trifido, processu intermedio nec spiniformi nec erecto; femoribus simplicibus; segmento ventrali penultimo haud emarginato. Long., $4\frac{1}{2}$—$5\frac{1}{2}$ l.; lat., $1\frac{3}{4}$—2 l.

Allied to *C. nodicollis*, Bourg., but differing from it, *inter alia*, by the markings of the elytra much more widely than my observation of a good many specimens of *Calochromus* allows me to think compatible with mere colour variety. The elytra of *C. nodicollis* are described as being entirely ochraceous except a narrow basal border, while in the present species their marking consists of a large common patch touching the base but not quite reaching to the lateral margins and extending hindward to the length of two-thirds of the elytra and slightly narrowing towards its apex, so that the red margin gradually widens slightly from its base and the apical one-third of the elytra is entirely red. Thus the black patch bears a rough resemblance to a hood thrown back over the elytra from their base. This marking seems constant. There are various details in which this insect departs otherwise from the description of *C. nodicollis; inter alia* the interstices of its elytral costæ are said to be rugose whereas in the present species they are excessively finely granulated,—scarcely more than coriaceous, and *nodicollis* is said "to a casual inspection to remarkably recall *C. scutellaris*, Er.," whereas the present insect is a much more robust species of considerably wider form with very much longer antennæ. The measurements of *C. nodicollis* make it fully three times as long as wide; *C. cucullatus* is distinctly less than three times as long as wide. Of the other previously described *Calochromi*, none seem to have the remarkable clypeal sexual characters of this species,—some have the prothorax bicolorous (very remarkably so in *C. brevicornis*, Lea, and *pilosicornis*, Lea, in which the prothorax is said to be "yellow tinged with red," and those having a black prothorax (even if the clypeal sexual characters have merely been overlooked in the descriptions,—as may be the case in one or two that I have not seen) present strongly marked differences that make this species very distinct.

Victoria; Dividing Range.

C. simillimus, sp. nov. Præcedenti (*C. cucullato*) affinis; differt elytrorum parte communi nigra antice angusta (ultra costam primam haud extensa) sat longe ante medium dilatata (sicut

hinc fere ad apicem costam tertiam fere attinet) ante apicem sat abrupte truncata, prothoracis basi sat fortiter bisinuata (sicut certo adspectu anguli postici nonnihil retrorsum directi videntur). Long., $5\frac{1}{2}$ l.; lat., $1\frac{4}{5}$ l.

Apart from the characters noted above the description of *C. cucullata* is an accurate description of this insect, and therefore need not be repeated. The markings of the elytra are identical in all the specimens that I have seen. The difference in the form of the base of the prothorax furnishes a satisfactory structural character.

S. Australia; Adelaide District.

C. rostratus, sp. nov. Elongatus; minus convexus; minus nitidus; supra pubescens; niger, prothoracis lateribus et elytris totis aurantiaco-rufis; capite minus porrecto, antice rostro manifesto (hoc quam longiori sat latiori) instructo, inter oculos longitudinaliter minus profunde canaliculato; prothorace transversim subquadrato, longitudinaliter canaliculato (antice subtiliter, postice profunde), transversim carina obtusa (hac in medio minus perspicua) sinuatim antrorsum ex angulis posticis arcuata instructo, disco postice tuberculis obtusis 2 munitis, lateribus sinuatim subrectis, basi leviter bisinuata, angulis anticis fere nullis posticis fere rectis; elytris striatis, interstitiis angustis leviter convexis (alternis quam cetera vix magis definitis); antennis quam corporis dimidium vix longioribus, modice compressis, articulis 3° 4° que longitudine sat æqualibus.

Maris segmento ventrali septimo profunde emarginato.

Feminæ segmento ventrali septimo profunde fere ad basin triangulariter impresso et ad apicem emarginato. Long., 4 l.; lat., $1\frac{2}{5}$ l. (vix).

The comparatively slight exsertion of the head in this species together with the presence of a distinct rostrum and the scarcely noticeable dilatation of the front femora in the male renders this species very distinct from any other Australian *Calochromus* known to me. All these characters, however, seem to be present in some of the species from other countries described in Mr. Waterhouse's monograph of the genus (Cist. Ent., II.), the essential character of *Calochromus* among the *Lycides* being there regarded as the "absence from the elytra of distinct carinæ separated by rows of punctures" together with the presence of seven ventral segments. In the species before me an excessively short basal ventral segment is certainly present in the male; in the female I am not so sure of there being seven segments but probably there is an extremely short basal one which would be discernible if the hind body were broken off. The sculpture of the prothorax also differs from that of any other Australian

Calochromus that I have seen; a thick wheal-like edging commences at the posterior angles and proceeds a very short distance along the lateral margin and then curves inward and arches across the middle of the disc, being however narrowly interrupted on the middle line by the longitudinal median impression. There is an obtuse gibbosity on either side of the middle line immediately in front of the base and a somewhat deep excavation immediately within the hind angles. The prothorax is entirely margined with a thickened edging which however is not so thick as the wheal-like carina that crosses the disc.

S. Australia; taken by Mr. Jung on Yorke's Peninsula.

TENEBRIONIDÆ.

CHALCOPTERUS.

C. Kochi, sp. nov. Sat cylindricus; sat nitidus; niger, elytris metallico-versicoloribus (in disco cœruleis, latera versus aureo-viridescentibus, suturam versus purpurascentibus); capite crebre sat æqualiter punctulato, inter oculos quam antennarum articuli basalis longitudo fere angustiori; sulcis ocularibus nullis; antennis quam corporis dimidium sat brevioribus, articulo 3° quam 1us 2us que conjuncti manifeste longiori, quam 4us 5us que conjuncti manifeste breviori, articulis 8°—10° quam præcedentes multo brevioribus; prothorace quam longiori fere duplo (postice quam antice duplo) latiori, crebre subtiliter distincte sat æqualiter punctulato, lateribus (superne visis) pone medium fere parallelis, basi media sat anguste sublobata, angulis anticis obtusis; elytris æqualiter sat subtiliter (quam *C. Howitti*, Pasc., vix minus subtiliter) postice magis subtiliter seriatim punctulatis, interstitiis planis subtiliter (quam series permulto magis subtiliter) vix crebre punctulatis; prosterno sat distincte carinato; metasterno distincte punctulato et fortiter oblique rugato, episternis opacis leviter punctulatis; tarsis subtus nigro setosis, posticorum articulo basali quam 4us haud multo longiori; abdomine modice punctulato et longitudinaliter rugato. Long., 9½ l.; lat., 4⅘ l.

This extremely fine species is allied to *C. cupreus*, Fab., *brevipes*, Blackb., and *grandis*, Macl. From *cupreus* it differs *inter alia* by its entirely different colouration and (presuming my identification of that species to be correct) by its much more cylindrical form, very much more slender antennæ with quite differently proportioned joints and seriate punctures of elytra becoming much finer in the apical third; from *brevipes* it differs *inter alia* by its notably wider prothorax and much finer puncturation of the elytral interstices (so that the elytral series stand out much more conspicuously); and from *grandis inter alia* by

the much shorter basal joint of its hind tarsi. I am doubtful of the sex of the example before me (it is difficult to determine the sex of a *Chalcopterus* unless both sexes can be examined), but it is probably a female. In my tabulation of *Chalcopterus* (P.L.S., N.S.W., 1893) this species may be placed beside *cupreus*, Fab. (p. 60) though its prothorax is not quite "*fully*" twice as wide as long (but it is notably wider than in *brevipes*), from which it may be thus distinguished :—

J. Prothorax twice (or all but twice) as wide as long.
  K. Seriate puncturation of elytra not enfeebled behind [*cupreus*, Fab.]
  KK. Seriate puncturation of elytra becoming very feeble near apex ... ... *Kochi*, Blackb.

S. Australia ; Basin of Lake Eyre ; sent by Herr Max Koch.

C. gracilicornis, Blackb. (Tr. R.S., S.A., 1899, p. 45). The habitat of this species is N.W. Australia.

C. mundus, Blackb. (*l.c.*, p. 48). The habitat of this species is N. Queensland.

RHIPIDOPHORIDÆ.

EVANIOCERA.

E. persimilis, sp. nov. Mas. Picea, elytris rufescentibus; minus nitida; confertim subtiliter punctulata; cinereo-pubescens (lineatim in elytris); oculis modicis, subapproximatis (interspatio quam antennarum articuli basalis longitudo parum latiori separatis); antennarum articulis 1° compresso breviter piriformi, 2° parvo transverso, ceteris ramos elongatos singulos emittentibus, articuli 3ⁱ ramo quam ceterorum paullo breviori (a ramo articuli 4ⁱ vix longius quam ramus articuli 4ⁱ a ramo articuli 5ⁱ remoto); prothorace conico, basi bisinuata, lateribus (superne visis) vix sinuatis; elytris postice minus angustatis.

Feminæ antennarum articulis (basalibus 2 exceptis) sat fortiter serratis. Long., $2\frac{1}{2}$—$4\frac{3}{4}$ l.; lat., 1—$1\frac{4}{5}$ l.

Closely allied to *E. Meyricki*, Blackb., with similar elytral pattern (about six narrow vittæ of whitish pubescence on each elytron) and the same number (nine) of antennal rami; differing from it in the ramus of the third joint being fully three-fourths of the length of the longest ramus (in *Meyricki* it is scarcely more than half) and scarcely more distant from the second ramus than the second ramus is from the third. It is moreover a more robust insect, less narrowed behind, with the prothorax less elongate and having posterior angles less strongly directed hindward. The other previously described species having nine antennal rami are *pruinosa*, Gerst., and *perthensis*, Blackb., neither of which has elytra marked with longitudinal pubescent vittæ; moreover *pruinosa* has the first antennal ramus even shorter than that of *Meyricki*, a much more elongate prothorax,

&c.; while in *perthensis, inter alia*, the antennal rami are all less elongate and the antennal joints are shorter so that all the rami are notably more closely packed together than in the present my knowledge seen, the antennæ of which are not exactly species. The two species of the genus that I have not to described, are *Gerstäckeri*, Macl., and *Gerstäckeri* [Macl.?], Champ. which are so differently coloured that they are not at all likely to be identical with the present species. The rest of the described species have only eight antennal rami in the male. In my tabulation of the species of *Evaniocera* (Tr. Roy. Soc., S.A., 1899, p. 52) this species will stand beside *E. perthensis*, Blackb., from which it may be distinguished thus:—

C. Eyes divided ... ... *perthensis*, Blackb.
CC. Eyes normally emarginate ... ... *persimilis*, Blackb.

Victoria; in my collection; also in the collection of Mr. French.

E. perthensis, Blackb. When I described this species (*l.c.*, p. 53) I did not notice the remarkable character mentioned above. In *E. nervosa*, *Meyricki*, &c., the eyes are very deeply emarginate, but the two lobes are connected perfectly distinctly; while in this species the two lobes are absolutely disconnected, so that the insect has four eyes,—a character which may perhaps have to be treated as generic eventually.

EMENADIA.

E. difficilis, Blackb. (Tr. R.S., S.A., 1899, p. 55). The habitat of this species is South Australia.

CURCULIONIDÆ.

BARIS.

B. orchivora, Blackb. Sat lata; minus nitida; glabra; picea (nonnullorum exemplorum elytris latera versus rufescentibus); rostro quam prothorax sublongiori, compresso, apicem versus nitido fortiter crebre punctulato et longitudinaliter strigato, scrobibus subtus conniventibus; oculis subtiliter granulatis; antennarum scapo oculum fere attingenti; prothorace confertim subgrosse punctulato; scutello modico granulato; elytris a basi retrorsum leviter angustatis, fortiter striatis, striis indistincte cancellatis, interstitiis crebre granulatis; femoribus sat elongatis vix clavatis, dente parvo armatis; tibiarum unco apicali parvo horizontali; unguiculis subparallelis, ad basin fere connatis. Long. (rostr. excl.), $1\frac{4}{5}$ l.; lat., $\frac{4}{5}$ l.

A very distinct species. It was bred in Sydney from the stems of a Queensland Orchid (*Dendrobium* sp.) and sent to me by Mr. W. W. Froggatt.

BRUCHIDÆ.

BRUCHUS.

B. lyndhurstensis, sp. nov. Rufo-castaneus, capite antennis apicem versus metasterno elytorum sutura maculisque nonnullis lateralibus et tarsorum apice obscurioribus; supra pube ochracea et albida indeterminate variegatus; subtus cum pygidio sat dense albido-pubescens; capite modice elongato minus lato (fere ut *B. rufimanus*, Schönh.) inter oculos longitudinaliter carinato; oculis subtiliter granulato (ut *B. rufimanus*); antennis sat brevibus sat robustis, articulis 5°—10° inter se sat æqualibus leviter transversis leviter serratis; prothorace conico, crebre subtiliter aspere punctulato; elytris subtiliter striatis, interstiis planis ut prothorax punctulatis; femoribus posticis inermibus.

Maris segmento basali ventrali fovea magna circulari (hac pube subtili flava in funda vestita) impresso. Long., 1 l.; lat., $\frac{3}{5}$ l.

Variat antennis minus obscuris, capite postice testaceo, elytris in sutura et ad latera magis late obscuris, pygidio nigro-maculato vel fere omnino nigro, femoribus posticis plus minusve obscuris.

A most variable species, if I am right in considering the specimens before me (which were taken by myself and others, in Central Australia in seeds of Cassia) as representing only a single species. The most distinctive character seems to be that on the basal ventral segment of the male, consisting in the presence of a large shallow circular impression placed anteriorly, and having a diameter equal to about two-thirds of the length of the segment on the median line. In some examples this impression is more sharply defined on the hind part of its outline than in others, and in some its floor is covered with fine yellow pubescence, which is wanting in others. I take these differences to be caused partly by abrasion and partly to be an instance of the variability in respect of development of sexual character so often found in species where such characters are of a very pronounced type. Only one species (*B. perpastus*, Lea) of *Bruchus* with unarmed hind femora has hitherto been described as Australian, and unfortunately the description of that insect does not refer to sexual characters—but its stating that the insect is black and of almost circular outline, with a triangular scutellum, seem to indicate clearly that it is not much like the present insect. In the species I am describing the scutellum is somewhat quadrangular, though appearing of different form according to degree of abrasion, position of prothorax, &c., but not definitely triangular in any specimen. In Mr. Lea's tabulation of *Bruchi* (Proc. L.S., N.S.W., 1898, pp. 637-8) the place of this species is beside *B. perpastus*, Lea.

Central Australia; Oodnadatta, Lyndhurst (Koch), Leigh's Creek, &c.

B. Oodnadattæ, sp. nov. Nigricans, antennis sordide testaceis apicem versus vix infuscatis, pedibus testaceis, femoribus (præsertim posticis) plus minusve nigricantibus, elytris ad apicem plus minusve distincte rufescentibus; supra pube nigricanti et albida indeterminate variegatus, subtus cum pygidio sat dense albido-pubescens; femoribus posticis ante apicem denticulo manifesto sed minuto armatis; cetera ut *B. lyndhurstensis*.

Maris segmento basali ventrali antice fovea parva ovali leviter impresso.

Differs from the preceding by its very different colouring, by the presence of an extremely small denticulation on the hind femora and by the very much smaller fovea (which is elongate oval, not circular) on the basal ventral segment of the male. In some examples the elytra are only vaguely reddish at the apex, in others there is an extremely well defined bright red apical spot. In Mr. Lea's tabulation of *Bruchi* (*loc. cit.*) the place of this species is beside *diversipes*, Lea, from which it differs *inter alia* by the minute size of the tooth on its hind femora.

Central Australia.

B. diversipes, Lea. I have an example of this species courteously sent me by Mr. Lea, and also numerous specimens of the larger insect from W. Australia, which he dubiously identifies with it. I doubt the identity of the two, although I cannot find any good structural character to distinguish them. Unfortunately my specimen of typical *diversipes* is a female. The basal ventral segment of the male of the larger insect is without any sexual fovea. Perhaps an examination of a male *diversipes* from N.S. Wales might show a valid distinction on the basal ventral segment.

B. quornensis, sp. nov. Niger, antennarum articulis basalibus 4, elytrorum disco apiceque et pedibus (femorum basi et tarsorum apice exceptis) rufo-testaceis; supra pube albida et testacea vel rufa variegatus; subtus cum pygidio minus dense albido-pubescens; capite modice elongato, inter oculos longitudinaliter carinato; oculis sat subtiliter granulatis; antennis sat elongatis, articulis 5°—10° robustis leviter serratis; prothorace transversim trapezoidali, antice minus fortiter angustato, crebre subtiliter ruguloso, elytris subtiliter punctulato-striatis, interstitiis planis fere ut prothorax asperis sed paullo magis subtiliter; femoribus posticis dente parvo acuto armatis.

Maris segmento basali ventrali nullo modo foveolato. Long., 1 l.; lat., $\frac{3}{5}$ l.

Variable in the colouring of the elytra. The base, suture and lateral margins are broadly piceous or black, but in some examples somewhat mottled with whitish or castaneous pubescence; the rest of the surface (a broad discal patch not reaching the base) is of lighter colour and is variegated with whitish and slightly reddish pubescence not differing much in colour, but each shade running longitudinally so as to give a faintly striped appearance; abraded examples have black elytra with a wide reddish discal vitta not reaching the base. The antennæ have their fifth and following joints much wider in comparison with the fourth joint than in the species described above, causing the antennæ to appear as consisting of a stem of four joints and a long serrate club of seven joints (the first three joints of which gradually increase in size). The tooth on the hind femora is much larger than that of *B. Oodnadattæ* but a little smaller than that of *B. diversipes* and does not seem to vary in development. In Mr. Lea's tabulation of *Bruchi* this species stands beside *B. despicatus*, Lea, from which it differs *inter alia* by the basal four (not three) joints of its antennæ testaceous and their series of serrate joints beginning with the fifth (not the fourth).

S. Australia; Quorn.

B. fabæ, Fab. I presume that the insect which Mr. Tryon reported (Tr. Nat. Hist. Soc., Brisbane, vol. I.) as *B. obtectus*, Say, is this species. Mr. Tryon does not say why he prefers Say's name; it is to be noted however that it is later than that of Fabricius.

B. pisi, Linn. In a note to his remarks on *Bruchus* (*loc. cit.*) Mr. Lea quotes Mr. Tryon as having reported a species from Queensland as "*B. pyri.*" Mr. Tryon, however, has no such name, but mentions "*B. pisorum.*" I presume both names are intended for *B. pisi*, Linn.,—indeed in the body of his paper Mr. Lea mentions *B. pisi* (without an author's name) apparently as the same species which in the note he calls *pyri*.

B. persimulans, sp. nov. Niger, antennis (his nonnullorum exemplorum articulos 6°—10° plus minusve infuscatos præbentibus), pedibusque (horum femoribus posticis basin versus et tarsorum articulo ultimo obscuris) testaceis, elytris rufis nigro-cinctis (apice rufo excepto); sat æqualiter cinereo-pubescens; antennarum articulis 4°—10° sat robustis leviter serratis; elytrorum interstitiis quam prothorax multo magis subtiliter sculpturatis, vix asperis; cetera ut *B. quornensis*.

Maris segmento basali ventrali nullo modo foveolato. Long., $1\frac{2}{5}$ l.; lat., $\frac{4}{5}$ l., vix.

Except in respect of the characters mentioned above, the description of *B quornensis* applies to this species also. The

colouring of the derm in the two insects is very similar, but the pubescence of the elytra differs considerably, a fresh specimen of *quornensis* having a very mottled appearance while a fresh specimen of *persimulans* has an even vestiture of whitish pubescence. The present insect is considerably larger than *quornensis* and has very different antennæ, there being much less difference in size between the fourth and fifth joints and the fifth and sixth joints being *inter se* equally dilated, while in *quornensis* the fifth joint is notably less dilated than the sixth. *B. persimulans* also has a good deal of colour resemblance to partially abraded examples of some varieties of *B. lyndhurstensis*, but is readily distinguished from it by its longer antennæ, black prothorax, as well as by the presence of a tooth on the hind femora and the absence of sexual characters on the basal ventral segment. This species does not fit into any of the groups in Mr. Lea's tabulation, not having its prothorax and elytra either both red or both black.

Central Australia; Oodnadatta.

PHYTOPHAGA.

MEGASCELOIDES.

M. circumcinctus, sp. nov. Fem. Minus elongatus; pubescens; piceus, antennarum basi capite prothorace antice elytris (marginibus totis anguste piceis exceptis) pedibusque rufis; capite brevi lato sat fortiter punctulato; antennis filiformibus quam corporis dimidium sublongioribus; prothorace quam longiori plus quam sesquilatiori, subquadrato, convexo, subtiliter inæqualiter punctulato, marginibus omnibus sat rectis, angulis anticis subdentiformibus posticis obtusis; elytris sat crebre minus subtiliter punctulatis, lineis vix elevatis longitudinalibus circiter 3 instructis; femoribus leviter incrassatis. Long., $3\frac{3}{8}$ l.; lat., $1\frac{3}{8}$ l. (vix).

The insect described above has been in my collection for some considerable time placed doubtfully as belonging to the *Megascelides*. Mr. French has recently sent me an insect closely allied to it which being a male I can identify confidently with Mr. Jacoby's genus *Megasceloides* (it is probably the typical species); and by comparing my species with it I have satisfied myself that the former is a female of the same genus. It differs from the male in what are likely to be sexual characters by the intermediate joints of its antennæ scarcely dilated and its less strongly dilated femora. Specifically it differs from *M. pallidus* by its colouring (the prothorax piceous with its anterior one-third testaceous and the elytra narrowly and abruptly edged all round with piceous black), by its notably more transverse prothorax, the front angles of which are dentiform, and by the less numerous elevated lines on its elytra.

W. Australia.

EDUSA.

The following species while certainly, I think, a member of the group *Edusites*, differs from typical members of the genus *Edusa* by its unusually narrow parallel form and its entirely glabrous upper surface. Five *Eduscid* genera have been recorded as Australian, viz., *Edusa*, *Eduscides*, *Clepter*, *Thaumastomerus* and *Ocnida*. The insect before me certainly cannot be attributed to the second or third of those genera,—but the last two do not appear to me to have been satisfactorily differentiated from *Edusa*. *Thaumastomerus* was unknown to Dr. Chapuis (as it is to me) and he conjectured that it ought not to be separated from *Edusa*. Of *Ocnida* he says that its diagnosis does not contain any tangible character for identification,—in which opinion I agree with him. The following species is not any of those that have been attributed to those genera, and so far as I can make anything of the generic diagnoses it does not agree with them, nor can I find any marked structural character inconsistent with its place in *Edusa* which (as Dr. Chapius conceived it) included forms widely differing in superficial characters.

E. angustula, sp. nov. Sat angusta, sat parallela; supra glabra; subtus pilis erectis brevibus gracilibus sparsim vestita; metallico-versicolora (viridis, aureo cupreoque varie micans), antennis (his apicem versus infuscatis) palpis labro pedibusque testaceis; capite verticali, sparsius subtilius punctulato; antennis filiformibus apicem versus parum incrassatis, quam corporis dimidium parum longioribus; prothorace leviter transverso, ut caput (latera versus magis crebre) punctulato, antice modice angustato, lateribus arcuatis, angulis anticis obtusis nullo modo productis, posticis obtusis (his, in prosterno visis, dentiformibus); elytris crebre punctulatis, apicem versus nonnihil punctulato-striatis, totis fortiter rugatis; femoribus (sexus observati) haud dentatis sed subtus late subangulatim dilatatis. Long., 2 l.; lat., $\frac{4}{5}$ l.

In my tabulation of the species of *Edusa* (Tr. R.S., S.A., 1891, pp. 142-3) this insect falls beside *glabra* (at the end of the table) from which it may be thus distinguished :—

C. Form widely oval ... ... *glabra*, Blackb.
CC. Form narrowly parallel ... ... *angustula*, Blackb.

I have seen four examples of this species, among which I find no conspicuous sexual differences. Probably they are all females.

W.A.; sent by Mr. French.

RUPILIA.

R. angulaticollis, sp. nov. Ovata; minus nitida; supra obscure cœrulescens, capite antice antennis (apice excepto) prothoracis marginibus omnibus scutelloque plus minusve

distincte rufescentibus; subtus obscure rufa, abdomine obscure cœruleo viridimicanti, pedibus piceis plus minusve rufescentibus; capite inter antennas longitudinaliter excavato minus perspicue punctulato, postice planato sparsim sat grosse vix fortiter punctulato; antennis robustis minus elongatis, articulis 1° 3° 4° que longitudine inter se sat æqualibus; prothorace quam longiori duplo latiori, crebre aspere vix rugulose punctulato, margine antico quam basalis vix angustiori (ambobus sensim elevatis), lateribus ante medium fortiter angulatis (hinc antrorsum et retrorsum convergentibus); elytris parum dehiscentibus, haud longitudinaliter impressis, crebre minus subtiliter subaspere nec rugulose punctulatis; scutello lato, fere ut elytra punctulato.

Maris elytris ultra segmentum ventrale penultimum attingentibus minus latis; feminæ segmenti penultimi medium vix attingentibus sat latis. Long., 3—3½ l.; lat., 1⅔ l.—2 l.

Differs from *R. ruficollis*, Clk., *inter alia*, by its much more strongly transverse prothorax and its much longer elytra. *R. viridi-ænea*, Clk., is not described in a manner to allow of very satisfactory comparison, but the present species is very differently coloured, and the phrase "*capite inter oculos transverse foveolato*" does not describe at all correctly the sculpture of the head of the present species. In *R. impressa*, Blackb., and *brevipennis*, Blackb., *inter alia multa*, the prothorax is very much more nitid and less conspicuously punctulate. *R. rugulosa*, Blackb., has very much more rugulose sculpture, and *R. excelsa*, Blackb., besides being very differently coloured has *inter alia*, a less transverse prothorax (its width to its length down the middle as 8 to 5) which is traversed by a very strong and conspicuous transverse sulcus.

N. Queensland.

R. approximans, sp. nov. Ovata; modice nitida; obscure rufescens, elytris obscure cyaneis violaceo-tinctis; capite sparsissime punctulato, linea longitudinali subtili impresso, hac ut fovea elongata profunda inter antennas dilatata; antennis elongatis, articulo 3° quam ceteri sat longiori; prothorace quam longiori sesquilatiori, longitudinaliter late canaliculato, subfortiter minus crebre (ad latera sat crebre), punctulato, latitudine majori antice sita, margine antico late elevato-crassato, lateribus (desuper visis) ab apice ultra medium leviter subrecte (hinc ad basin valde fortiter) convergentibus; elytris modice dehiscentibus, a basi retrorsum breviter minus perspicue impressis, confertim subtilius punctulatis; scutello modico.

Maris antennis ultra elytra media attingentibus; elytris segmentum ventrale penultimum medium attingentibus.

Feminæ antennis elytrisque nonnihil brevioribus.

Var. elytris antice suturam versus rufescentibus. Long., 4½—5½ l.; lat., 2—2⅔ l.

Differs from the description and figure of *R. ruficollis*, Clk., and *brevipennis*, Blackb., *inter alia*, by its much longer and more ample elytra, from *R. viridiænea*, Clk., by the same characters as *angulaticollis* differs by, from *rugulosa*, Blackb., by its non rugulose sculpture, from *angulaticollis* by its very different antennæ, and from *excelsa*, Blackb., by the sculpture of its prothorax. It is near *R. impressa*, Blackb., but differs from it by the strongly and widely thickened front margin of its prothorax, the much closer and more distinct puncturation of that segment, &c. In *R. impressa* there is a transverse ill-defined gibbosity on the prothorax, but it is situated distinctly behind the front margin.

N. Queensland.

MONOLEPTA.

M. cognata, Blackb. This insect,—described from N. Queensland,—has been sent to me by Mr. French as taken in W. Australia.

COCCINELLIDÆ.

LIPERNES.

This name (which I used for a *Coccinellid* genus, Tr. R.S., S.A., 1888, p. 211) I find had been previously used by Mr. Waterhouse for a genus of *Lycides*. I therefore propose as a substitute for my name *Notolipernes*.

SULVANITE: A NEW MINERAL.

By G. A. GOYDER.

[Read June 5, 1900.]

Some specimens were sent to the Assay Department of the Adelaide School of Mines and Industries for assay for copper by Mr. E. Meylan, of Port Pirie, who stated that they were obtained from a new mine near the Burra.

During the analysis for copper I found that they contained vanadium, and therefore wrote for further samples, which Mr. Meylan promptly sent.

On examination these proved to consist of malachite, azurite, vanadium ochre, quartz, calcite, gypsum, and a metallic mineral, consisting principally of copper, sulphur, and vanadium.

A small piece of this mineral, as free as possible from associated minerals, was powdered and digested with acetic acid (which removed some malachite and calcite), washed, dried, and analysed. There was not sufficient for an accurate analysis in detail, but the following figures were obtained:—

Per cent.	Per cent.	Per cent.
Copper, 58·82	Vanadium, 11·88	Sulphur, 26·44

the balance being silica, lime, and a trace of iron.

The ratio of copper to vanadium was confirmed by a duplicate analysis of a smaller sample by a different method of analysis.

The mineral was found to contain no sulphur in the form of sulphate, and on heating in a closed tube it gave off no sulphur, from which it would appear that the copper must be in the form of Cu_2S, with the vanadium as V_2S_3. The ratio of Cu_2S to V_2S_3 in the sample analysed is $3\frac{1}{2}$ to 1, but an analysis of some other specimens not so pure proved them to contain an oxidized vanadium mineral with a smaller relative proportion of copper, so that the composition of the mineral is most probably $4Cu_2S$, V_2S_3, which constitutes it a basic sulpho-vanadite of copper.*

The samples sent me were all in a more or less oxidized form, and as the mineral is not distinctly crystalline, and is penetrated by oxidised products almost throughout, its physical properties cannot be accurately ascertained.

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* Subsequent analyses show that the mineral is a sulpho-vanadate of copper, $3Cu_2S$, V_2S_5.

The lustre appears sub-metallic, and the colour bronze, the specific gravity over 4, and the hardness 3·5.

As far as I can ascertain from the publications to hand, there is no record of any unoxidized vanadium mineral.

Mr. Meylan has promised to send me some further samples, and should the mine be worked deep enough, some of the pure unoxidised mineral may yet come to hand, in which case further analyses will be made and the physical properties more accurately ascertained.

Evidences of Extinct Glacial Action in Southern Yorke's Peninsula.

By Walter Howchin, F.G.S.

[Read June 5, 1900.]

Glacial deposits have already been described in the Transactions of this Society as occurring on the eastern and southern shores of Gulf St. Vincent, and in most cases such deposits extend seawards and pass from view below low-water mark. It may, therefore, be inferred that the southern portion of the present gulf occupies an eroded hollow or depression in what was formerly an extended area of glacial till. On this assumption it seemed highly probable that the southern portions of Yorke's Peninsula would be included in the extinct glacial field. This supposition has been amply confirmed by discoveries made during Easter week of the present year. The southern portions of the Peninsula have a lateral extension, shaped like a human foot; the northern and southern coasts of this area were visited, and very instructive sections of the glacial beds were observed, whilst many localities inland furnished confirmatory evidences of the previous existence of ice on a large scale.

Southern Coast.

Troubridge Hill.—The first locality visited was Troubridge Hill, about ten miles from Edithburg, in a south-west direction, viâ Honiton. The sea-cliffs near the Hill are composed of calciferous sandstones capped by travertine limestone. The sea breaks at the base of the cliffs, which are being rapidly undermined. At a distance of about half a mile to the west from Troubridge Hill the base of the Eocene beds is exposed, and the latter are seen to rest on an eroded surface of glacial till. The Eocene beds are here reduced in thickness to a layer of three feet, consisting of loosely held comminuted fragments of polyzoa, with countless numbers of the small echinoderm, *Fibularia gregata.* The occurrence of this echinoid in the bed referred to fully justifies its specific name, as it is mostly aggregated in clusters, varying in size up to a foot in diameter.

The following is a section of the cliffs as seen at this spot:—

1. *Recent*—Travertine limestone ... ... 10 feet
2. *Eocene*—Fossiliferous (*Fibularia gregata*) limestone 3 "
3. *Pre-Tertiary*—Glacial till with erratics; thickness unknown; height exposed above sea level ... 8 "

The till has the character of a red clay with bluish streaks, and rises suddenly in the cliff face in the form of one or two nodular inliers, around and over which the sediments of the Eocene sea has gathered. The clay carries erratics to a limited extent, but numerous stones of this character, liberated by the waste of the cliffs, lie at their base and along the beach.

About a mile further to the westward the glacial clay is again seen in a much more important exposure, extending in a line of cliffs for about a mile in an east and west direction. The cliff face has a maximum height of about 50 feet, and the thickness and character of the strata vary within the distances of a few yards in a very remarkable manner. The following two sections can be seen on the same horizon within a distance of less than one hundred yards:—

EASTERN SECTION.

1. *Recent*—	Travertine limestone	20 feet
2. *Pre-Tertiary* (*Glacial*)—	Dark-coloured clay	10 "
	White and pink-coloured argillaceous sands, base not exposed; thickness above sea level	20 "

WESTERN SECTION.

1. *Recent*—	Travertine limestone	3 "
	Calcareous sand rock, (?) raised beach	8 "
	Travertine limestone	6 "
2. *Pre-Tertiary* (*Glacial*)—	Dark to reddish clay	6 "
	White kaolinised clay with red patches, angular grit and erratics; thickness above sea level	27 "

In the second of the above cliff sections there is what may be a raised beach deposit intercolated between two beds of travertine. It is composed, to the extent of three-fourths of its mass, of water-worn calcareous sand, and the remainder of fine quartz sand. The bed does not exhibit false bedding, as it would probably have done had it been wind blown, and, in weathering, it splits up by vertical jointing which gives it an appearance of a decomposed basaltic rock. If it be a raised beach, the lower bed of travertine in the section represents an old land surface that was (subsequent to its formation) submerged below high-water mark, and, at a later period, was raised again and received its second deposit of travertine limestone.

The white kaolinised glacial clay of this section is a remarkable bed, and has a peculiar chalk-like appearance as seen in the cliff face, but the presence of undoubted erratics scattered promiscuously through its mass, places its origin

beyond question. The erratics of the coast show that the ice must have passed over a granitic country in which the felspathic constituents of the rock greatly preponderated, and the kaolinised features of the clay on some parts of this coast may be caused by the waste produced by such a felspathic bed rock.

The beach in front of this line of outcrop is strewn with erratics of all sizes—quartzites and granites being in greatest numbers. One of these, a large tabular mass of coarse-grained, pink-colored, porphyritic granite, lying between tide marks, measured fully twenty feet in diameter.

The Eocene beds are absent from this section.

Port Moorowie is situated on the southern coast about ten miles south-west of Yorketown, and about six miles west of the glacial beds near Troubridge Hill, already described. A good exposure of boulder clay, carrying numerous erratics, extends for about a mile near the jetty, chiefly on its eastern side. The beds as seen in section in the cliffs make a low anticline with a maximum height of about 36 ft., exhibiting the following order:—

1. *Recent*—Travertine and calcareous marls		15 feet
2. *Pre-Tertiary (Glacial)*—	Reddish clay, with pipeclay bands ...	10 "
	White to bluish clay, with dark-red patches and streaks, carrying erratics; thickness exposed above sea level ...	11 "

The boulder clay of this section shows a general resemblance to the beds of the same age observed on the coast further to the east, and which have already been described. In the westerly outcrops of the Troubridge Hill beds (as also at Port Moorowie), the upper part of the clay, varying from six to ten feet in thickness, is apparently marked off from the underlying clay by a bedding plane. I saw no stones in this upper layer, the absence of which may raise some doubt as to its glacial origin, although such negative evidence cannot be taken as conclusive, as considerable bodies of undoubted glacial clay sometimes occur in South Australia in which no erratics are visible. I have included the layer in question provisionally in the glacial series, but further observations may show that it consists of re-arranged material from the underlying till bed, and belongs to a later period.

Erratics of small to moderate size are common on the beach at Port Moorowie. At one mile east from the jetty a boulder of grey granite, with large crystals of orthoclase giving it a porphyritic character, was observed, and measured at seven feet by four feet.

Northern Coast.

Point Turton.—An interesting geological section was found at Point Turton, situated on the shores of Hardwicke Bay, about six miles in a north-westerley direction from Warooka. The cliffs present a good face of rock as the Eocene limestone, of which the cliffs are chiefly composed, have been quarried for flux. The section that is exposed near the jetty is a very remarkable one, as it embraces no less than four distinct geological formations separated by three lines of unconformability.

The following is the order of occurrence:—

1. *Recent*—	Travertine limestone, variable in thickness up to	20 feet
2. *Miocene*—	Reddish, mottled clay, preserved in eroded hollows of lower Tertiary limestone; thickness *nil* to... ...	20 "
3. *Eocene*—	Pink-coloured fossiliferous limestone; variable in thickness up to	35 "
4. *Pre-Tertiary (Glacial)*—	Boulder clay, with glaciated erratics; thickness unknown; exposed above low water	15 "

The Miocene clay is best seen at a spot about a hundred yards west of the jetty, and has been preserved from denudation through occupying an eroded trench in the Eocene limestone, the latter having been nearly cut through by the eroding agents.

The Eocene limestone of the section is, as a whole, an extremely compact and pure carbonate of lime. It has been subjected to considerable alteration and reconstruction *in situ*, a secondary deposit of calcium carbonate having been precipitated within the interstices of the fossiliferous bed imparting to it a greater compactness. In some places most beautiful slabs of polyzoal stone, with the fronds weathered into strong relief, can be seen. The great purity of the stone makes it valuable as a fluxing agent.

The Eocene beds rest unconformably on the eroded surface of the glacial clay, the line of junction being very sharp.

The boulder clay is exposed for some distance in a variable thickness up to fifteen feet, and passes below sea level. The varying thickness of the bed is evidently the result of subærial waste that took place in pre-Tertiary times, before the old land surface was submerged by the Eocene sea. The clay is very compact, except where it is subjected to wave action below high-water mark, and even in that position it maintains a good hard floor that can be walked over without discomfort.

Immediately under the Tertiary limestone the clay is much impregnated with dendritic manganese, and the upper portion of the bed, notably the first three feet, is largely iron-stained. Many of the included boulders have formed a centre of segregation for the peroxide of iron, being thickly coated with this substance, giving them an appearance of nodular ironstone. When broken, however, the unaltered stone is seen to occur below the ferruginous crust. Beneath this iron-stained layer the clay is dark-colored in shades of bluish-black. When seen in plan on the beach (horizontal to the bedding), an extensive system of jointing can be recognised, the joint planes crossing each other at various angles.

The erratics contained in the clay are for the most part strongly striated or polished by ice action. The shingle of the beach consists mainly of erratics that have been liberated from the boulder clay through wave action on the cliffs. A large granite boulder occupies a position between tide marks, and measures three feet six inches in height.

INLAND LOCALITIES.

(*a*) *Warooka.*—The township of Warooka stands on a hill of boulder clay that has been eroded on three sides. On the north side of the township in Section 200 (Hundred of Moorowie), a dam has been excavated in this clay. About a dozen small erratics—chiefly quartzite and granite—were counted within a short distance of the excavation. The out crop becomes more characteristic as it is followed around the eastern and southern sides of the ridge, in Section No. 201. Near the extremity of the eastern spur a granite boulder, two feet in diameter, lies in the paddock. There are also about a dozen smaller fragments of granite lying around, which have probably been broken from the larger mass. The stone is coarse-grained with large crystals of orthoclase, in bunches and veins, resembling the granitic outcrops at Corney Point. On the south side of the ridge is another erratic of pink-colored granite, carrying black mica, about the same size as the one just described; and not far distant from the last-mentioned a third erratic was found, being a close-grained bluish quartzite, with polished face, and heavily scratched.

The outcrop of boulder clay was followed across the road dividing the Hundreds of Moorowie and Para Wurlie, and more granites were picked up in Section No. 23 of the latter Hundred.

A few small weathered pieces of Eocene limestone were seen on the north flanks of Warooka Hill, but whether such are the remains of a small outlier of rocks of this age in the

neighborhood, or were carried there, I am unable to say. To all appearance the only deposit superior to the glacial clay in the neighborhood is a thin crust of travertine limestone which lies directly on the boulder clay.

(*b*) *Corney Point Road.*—A large erratic occurs near the main road from Warooka to Corney Point. It is situated on the north side within about twenty yards of the road in Section No. 148, Hundred of Carribie, about two miles east of the Dairy Station, and seven miles from Corney Point. Its large size and isolated character has attracted general attention in the district, and has been recorded on the Government Map as the "Granite Rock." It measures above ground 7 ft. x 5 ft., but to all appearance its actual size is much greater. It is not a "granite rock" but a greyish-colored, granular, hornblendic schist, having a close resemblance to some of the highly metamorphic rocks on the coast at Corney Point. From the effects of weathering it has split into several pieces—the measurements given are intended to include the block as a whole. The occurrence of this transported stone in the position described, is interesting, as it marks the most westerly point that I was able to note the presence of glacial deposits.

(*c*) *Lake Fowler.*—This is the largest of the numerous salt lagoons that are scattered over the southern portions of Yorke's Peninsula. It is situated about four miles south of Yorketown, and is more than ten miles in circumference. The Lake occupies a depression in the boulder clay, proof of which can be seen at various points both on the lake bottom as well as in the cliffs that surround its margin. The most interesting assemblage of glacial features met with in my visit was on the north side of the Lake, in Section No. 178 (Hundred of Melville) at a spot that can be reached by a path from the road, through a slip panel, and across a field. Near where the path strikes the lake the sloping bank contains a group of twelve large pieces of pink-colored granite, having but a slight elevation above the ordinary level. The group measures ten feet by six feet, and was probably only one piece orginally, but has split along joint planes as the result of weathering.

About eighty yards to the westward of this erratic, other two huge granite blocks can be seen standing in the mud of the lake about a dozen yards away from the base of the cliff. On examination it was evident that the two fragments had been originally one block, the vertical fissure having probably occurred after it had become stranded in its present position. Conjointly they measure six feet six inches high and eight feet wide. Lying around this great erratic are

some half dozen other granite boulders varying in size up to several feet in diameter.

A short distance furtner to the westward can be seen two enormous masses of close grained bluish quartzites lying endways to the base of the cliffs. The first of these measures thirteen feet six inches by five feet six inches; and the second, which is separated from its companion by only a few feet, is almost as large. Similar boulders of a smaller size are strewn in the vicinity. It must have been ice of great transporting power that could carry stones of such a size as described.

The cliffs of the Lake near these erratics are about twenty feet in height, and consist intermittently of clay and sand rock. The change from the one feature to the other is often very abrupt. The clay is generally very compact, grey in color, with red patches; whilst the sand-rock may be colored white, yellow, or a deep brick-red. The stratigraphical lines are often very bewildering. In places no bedding planes can be detected, and in others they rapidly alter from the horizontal to nearly vertical direction, accompanied with contortions.

(*d*) *Munkowurlie Lagoon.*—This is a long narrow lagoon running parallel with the road between Yorketown and Port Moorowie. The widest portion of the lagoon is at its southern end, and on the eastern side of this larger basin in the lake two granite boulders are conspicuous. They are visible from the public road at a distance of about a quarter of a mile.

(*e*) *Moorowie Head Station.*—Situated about ten miles north-west of Yorketown on the edge of the Great Swamp country. I am indebted to Mr. Matthews, of Yorketown, and to Mr. Fowler, of Yararoo, for calling my attention to two erratics of granite which occur near this Station. I was unable to visit the locality, but the independent description given by the gentlemen named agree in every particular. One of the stones referred to measures three feet by eighteen inches, and lies on the east side of the main road in Section No. 38, Hundred of Moorowie. Mr. Fowler describes it as "red granite similar to the granite seen in the cliffs at Cape Spencer." The second of these boulders is described as much larger than the one just referred to, estimated at five feet by three feet, lying on the north side of a small lagoon in Section No. 37, about three-quarters of a mile from the first mentioned.

(*f*) *Lagoon at Pentonvale Head Station.*—Mr. Matthews, of Yorketown, has a granite boulder in his yard that had been brought from the above lagoon as an object of interest. The

locality is about three miles north-east of Yorketown. The stone is not so coarse in the grain as many of the erratics of the district, and was probably derived from a grey colored granite, as the evidence of this still remains, although the block, as a whole, is now of a deep red color from penetrating iron stains. The mica constituent is Biotite.

(*g*) *Well-Sinking at Yorketown.*—Sinking for water has been extensively tried throughout the district with varying success. All such sinkings have been in stiff clay, and I have learnt by enquiries that the occurrence of isolated stones in the clay is a common thing. Mr. Matthews, of Yorketown, has kindly placed in my hands a fragment of a granite boulder that was met with in sinking a well at Yorketown. It was found at a depth of 60 ft. from the surface, and has a distinctly polished face on one side. In no instance, so far as I could ascertain, was the clay bed penetrated to the bed rock in these sinkings.

(*h*) *Government Bore in Tocchi's Lagoon.*—In 1890 the Government put down a trial bore at the northern end of Tocchi's Lagoon, situated in Section No. 291, Hundred of Melville, about a mile east of Yorketown. Through the courtesy of Mr. J. W. Jones, Conservator of Water, I am enabled to give the following particulars of the strata passed through in the bore:—

	ft.	in.
Black mud	2	0
Dark clay with gypsum	28	0
Dark clay	270	0
Hard sandstone	3	0
Sandy clay	1	6
Very hard blue rock	0	11
Bore stopped at	305	5

The above sinking was evidently in the boulder clay of the district, and shows a local development of, at least, something over 300 ft. Work was stopped on meeting a hard rock, which was penetrated to the extent of eleven inches. The occurrence of a hard rock in such a formation could not be taken as definite proof that the base of the clay bed had been reached. It is extremely probable that the point at which the bore was stopped was not *bed rock*, but an included erratic that had come in line with the sinking and given the false impression that bottom had been touched. The section is, however, an extremely interesting one, and supplies evidence of the great thickness of glacial deposits that occur over the southern portions of the peninsula.

Concluding Remarks.

In the observations now detailed a very large area has been added to the known extent of the extinct glacial field of South Australia. The glacial outline has not only been carried across Gulf St. Vincent, but it is clear that practically the whole of the southern portion of Yorke's Peninsula, measuring, roughly, forty miles by twenty miles, has been at one time under glacial conditions. This conclusion has been forced upon me from the widely distributed proofs of ice action on the northern and southern coasts as well as throughout the inland districts. With the exception of a few outliers of Eocene limestone and some superficial deposits, the geology of the inland country is of a uniform character, and can be summed up in one great clay formation—the glacial clay. A unique feature of the district is the abundance of salt lagoons, of which there are no less than 200 recorded on the official maps within the area under consideration. There can be little doubt that the glacial clay underlies these lagoons and imparts to them the retentive quality, so that these saucer-shaped depressions, receiving the drainage of the country, play the part of evaporating pans and concentrate its salts. The waste of this clay along the banks of the lagoons leads to the exposure of the erratics belonging to the formation, some of which have been noted in this paper.

Another important datum line has been supplied by these observations bearing on the age of the glacial cold in these latitudes. At Hallet's Cove, on the opposite side of the Gulf, the evidence shows that the glacial deposits were laid down in pre-Miocene times. In southern Yorke's Peninsula the geological age of these deposits has been thrown back yet one more step through their occupying a stratigraphical position inferior to the Lower Tertiary. There is, moreover, clear proof of stratigraphical unconformability in the eroded* surface of the glacial clay on which the marine beds of the Older Tertiary rest. It is, therefore, I think, clear that the glaciation must be referred to pre-Tertiary times, and cannot be newer than a Cretaceous or Cretaceo-Eocene age.

The discovery of glacial clay inferior to the Eocene beds at Troubridge Hill and Point Turton will contribute to the correlation of beds of a similar character in other parts of the colony. On the north side of the mouth of the Onka-

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* At Corney Point, where the metamorphic rocks rise above sea level, there is a thin layer of Eocene limestone in a limited patch resting upon the primary rocks. The glacial clay is absent. At this elevation it may have been originally a thin deposit, and therefore easily denuded before the bedrock sunk below the level of the Eocene sea.

paringa, a clay in all respects similar to the glacial clays of southern Yorke's Peninsula, rises from beneath the fossiliferous Eocene beds with a northerly rise. A similar clay underlies the Eocene of Queenstown, Kangaroo Island, referred to by the author in a previous communication. From the apparent absence of erratics in these exposures some hesitation has hitherto been felt in referring the beds to the glacial age, but the evidence now available has greatly strengthened this supposition, and makes it almost certain that they belong to the same formation.

We have no reason to conclude that the extent of the glacial area in South Australia has even yet been fully determined. The limits of the evidence on Yorke's Peninsula, in a northernly direction, have not been fixed, and it is possible that the ice of a long past age may have left its impress on the southern portions of Eyre's Peninsula much further to the west. It is in these directions that further investigations should be especially made.

My acknowledgments are due to Mr. E. H. Matthews, of Yorketown; Mr. C. S. Keightly, Warooka; Mr. James Caldwell, junr., Honiton; and Mr. William Fowler, Yararoo, for information and other facilities by which I was enabled to utilise the short time at my disposal to the best advantage.

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TRANSACTIONS

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[WITH THREE PLATES.]

EDITED BY PROFESSOR R. TATE.

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Supplementary List of Plants from Mount Lyndhurst Run.

By Max Koch.

[Read June 5, 1900.]

In my lists of plants collected on Mount Lyndhurst Run, published in September, 1898, 334 species of indigenous plants were recorded. In the following supplementary list I enumerate 56 species. In addition to the 390 indigenous species, about 20 of introduced plants were noticed, of which *Sonchus oleraceus* and *Erodium cicutarium* may be regarded as well established.

Most of the plants of this list were named by Prof. R. Tate, Adelaide, and some by Mr. J. H. Maiden, Director of the Botanic Gardens, Sydney.

The most of the species are more or less rare in District S., and some 25 of them have not been recorded from there before; these I have marked by asterisk.

Cruciferæ.

*Erysimum lasiocarpum, *F. v. Mueller.*
Lepidium leptopetalum, *F. v. M.*
Sisymbrium filifolium, *F. v. M.*

Rutaceæ.

Geijera parviflora (?), *Lindley.* Collected by W. Langley.

Zygophylleæ.

*Zygophyllum crenatum, *F. v. M.* Collected by J. Langley.
*Zygophyllum hybridum, *Tate.*
*Zygophyllum Kochii, *Tate.* First seen by J. Langley, Trinity Well.

The genus Zygophyllum had occupied my attention during last spring, for I noted in the preceding year various forms which seemed to me different from those described in the handbooks at my disposal. Fortunately, almost all known species of Zygophyllum were growing in my neighbourhood, with the exception of *Z. glaucescens*, which was erroneously enumerated in my list of 1898. Professor Tate upheld me in my assumption of having found several new species, two of which he described and named (*vide* Tr. R.S., October 3, 1899, pp. 289-291).

In addition to these, the learned Professor admitted the occurrence of micromorphs as regards the corolla of *Z. ammophilum.* My No. 164 is the typical form of *Z. ammophilum;* leaflets elliptical to linear cuneate, entire; petals white, stamens four, seeds two in a cell, outer skin of seed rough (not shining). No. 458, *Z. ammophilum*, var.; petals white, stamens eight, fruits and seed the same as No. 164. No. 457, *Z. ammophilum*, var. or new species (?); leaflets broadly cuneate, notched; petals yellow, stamens eight, fruits truncate, rounded at the base, deeply angled; seeds one in a cell, of an oval shape—the outer skin of the seed is smooth and polished; a small prostrate annual. It will be seen this form differs from the typical form in—

(1) Foliage	164 leaflets entire ...	... 457 leaflets notched
(2) Colour of corolla	164 white	... 457 yellow
(3) Number of stamens	four ...	... eight
(4) Number of seeds in a cell	two	... one
(5) Form of seed	almost three angular	... oval in outline
(6) Outer coat of seed	dull and rough	... smooth and polished

I have supplied Prof. Tate with more material to work upon, and would not be surprised if he decides to raise No. 457 to specific rank. This form being prostrate in its habit, and the smallest of the genus, I suggest as an appropriate name *Zygophyllum humillimum.*

Malvaceæ.

Plagianthus glomeratus, *Bentham.*
*Sida intricata, *F. v. Mueller.*

Euphorbiaceæ.

Phyllanthus Gunnii, *J. Hooker.* A shrub.

N.B.—*Phyllanthus rhytidospermus* should be struck off my list of 1898.

Chenopodiaceæ.

An examination of Prof. Tate's Herbarium at the University has convinced me that the following species in list 1898 should be struck off:—

Atriplex leptocarpum, *F. v. M.*, for which I now assign *A. angulatum*, var., as the correct name.

Bassia bicornis, for which *B. diacantha* seems to be a better reference.

Amarantaceæ.

Ptilotus Hoodii, *F. V. Mueller.*

Leguminosæ.

Further study has revealed the fact that *Glycina tabacina*, in list 1898, is wrong, and should be Glycine sericea, *Bentham*.

Acacia salicina, *Lindley*.

Acacia cibaria, *F. v. Mueller*. This tree, or often shrubby tree, resembles so much in habit, foliage, and form of flowers to *Acacia aneura* that the species could not be defined until ripened fruits were obtained. *Acacia cibaria* is the species the seeds of which the blacks gather for food, and it is called by them *Mulka*, or by another tribe *Wodnera*, the same as *Acacia aneura*.

Both species are highly valuable as fodder for cattle and horses, and are often cut down for sheep in protracted droughts.

Ficoideæ.

*Mesembrianthemum australe, *Solander*. Collected by W. Langley, Knob Well.

Aizoon zygophylloides, *F. v. M.* The form with pink sepals, No. 354, is growing abundantly on the salt plains near Catt's and Publichouse Springs, north of Trinity Well.

Myrtaceæ.

Melaleuca trichostachya, *Lindley*.

Melaleuca parviflora, *Lindley*. Black Teatree.

Loranthaceæ.

Loranthus exocarpi, *Behr*.

A form with yellow petals, and green at the summit, is often found.

Compositæ.

*Astèr decurrens, *Cunningham*.

*Podocoma cuneifolia, *R. Br.*, var. 348. Leaves pinnate, and flowers much smaller than the legitimate form.

*Podocoma cuneifolia, *R. Br.*, var. 476. Leaves twice pinnate.

Minuriella annua, *Tate*. A small annual, first found in horse paddock of the "Village Well" on Mount Lyndhurst, but later on frequently met with on pipeclay soils throughout the district.

*Pterigeron microglossus, *Bentham*.

Podolepis Siemssenii, *F. v. Mueller*.

Helipterum corymbiflorum, *Schlechtendal*.

Helipterum incanum, *DeCandolle*.

Helipterum pterochaetum, *Bentham*.

*Helichrysum lucidum, *Henckel*.

Calocephalus platycephalus, *Benth.*

Calocephalus sp., No. 481 (?). Flowers too imperfect for specific denomination. It is a low perennial, with rigid, divaricate branches, stems, and leaves, which are short, densely woolly.

Goodeniaceæ.

Scaevola humilis, *R. Brown.*

Convolvulaceæ.

*Cuscuta australis, *R. Brown.*

Boragineæ.

Heliotropium asperrimum, *R. Br.* Collected by W. Langley.

Asclepiadeæ.

Cynanchum floribundum, *R. Brown.*

Jasmineæ.

Jasminum lineare, *R. Br.*

Solanaceæ.

Solanum eremophilum, *F. v. Mueller.*

Lentibularineæ.

Utricularia dichotoma, *Labillardiere.* Collected by J. Langley at Publichouse Springs, "north of Trinity Well," growing in shallow waters.

Myoporineæ.

*Myoporum deserti, *Cunningham.* A shrub.

Myoporum platycarpum, *R. Brown.* Sandalwood. Aboriginal name in the Dieyerie dialect, *Yumburra.*

*Eremophila Freelingii, *F. v. M.* A colour variety; flowers white. The typical shrub has a lavender corolla. Found by J. Langley near Trinity Well.

Juncaceæ.

Juncus bufonius, *Linne.*

Typhaceæ.

Typha angustifolia, *Linne.* Near Walparinna Springs.

Cyperaceæ.

On account of the difficulty of procuring well-matured specimens of these Cyper grasses, as they are largely cropped by stock, it seems to be impossible to arrive at a final and satisfactory result with some of the species, and the names given here must be considered as provisionally applied, and as liable to be improved upon.

*Cyperus castaneus, *Willd.* A dwarf annual (perhaps a variety, or, if not, a new species). New for the province of South Australia.

*Cyperus squarrosus (?), *Linne.* A form or an undescribed species.

Scirpus lacustris (?), *Linne*

Eriocauleæ.

*Eriocaulon submersum, *Tate.* Grows under water, except the tips of the leaves and the flowering stalk. First seen at Publichouse Springs by J. Langley, Trinity Well.

Gramineæ.

Panicum decompositum, *R. Brown.*

*Panicum adspersum, *Trinius.*

*Panicum sanguinale, *Linne.*

Spinifex paradoxus, *Bentham.*

*Andropogon bombycinus, *R. Br.*

Stipa aristiglumis, *F. v. M.*

*Agrostis Solandri, *F. v. M.*

*Eriachne scleranthoides, *F. v. M.*

*Diplachne Muelleri, *Bentham.*

*Diplachne fusca, *Palisot.*

*Distichlis maritima, *Rafinesque.* Near salt lakes, Publichouse Springs.

Filices.

Grammitis rutaefolia, *R. Brown.*

Characeæ.

*Nitella sp. Not sufficiently developed to admit of specific denomination. A weed growing under water in mud tanks.

Introduced Plants.

Avena fatua, *Linne.*

Anagallis arvensis, *Linne.* Flowers brick-red.

Anagallis arvensis, var. caerulea, *Schreb.* Flowers blue.

Definitions of Two New Species of South Australian Polyplacophora.

By Edwin Ashby.

[Read September 3, 1900.]

The discovery of the two new species of mollusca described in this paper is one of the many valuable results of Dr. Verco's dredging trips. Their discovery is of particular interest, because both genera are, as far as our present knowledge goes, very poorly represented in any part of the globe. Only one species of *Callochiton* has before been recorded from this colony. Henry A. Pilsbry, in his "Manual of Conchology," says of this genus and its allied genera—"Of the whole series there are very few species known. All of them are rare." And the other subgenus *Stenochiton* is only represented by two or three species, though the allied subgenus *Stenoplax*, to which the species herein described bears some affinity, is a little better represented; but no representative has yet been recorded from this colony.

Ischnochiton (Stenochiton) pallens, *sp. nov.* Pl. i., figs. 1*a*—*g*.

General Appearance.—Shell glossy, elongated, anterior portion tapering to rear. Evenly arched and rounded, side slope curved. *Colour.*—Cream, mottled with pink and pale brown.

Anterior Valve.—Smooth and glossy, except for several growth lines—that nearer the outer margin being the deeper. This valve is longitudinally much shorter than is the case in *Stenochiton juloides* and *S. Pilsbryanus*. Slits 13, at very irregular distances apart.

Posterior Valve. — Shield - shape tapering rapidly, mucro posterior, only slightly raised. A deep sulcus traverses the whole valve a short distance from the margin, preserving the shield outline of the shell. A shallow diagonal depression crosses the valve from the mucro to the suture. Surface of shell glossy and smooth, slight growth lines visible under the microscope. Slits six; the teeth are very irregular in contour.

Median Valves.—Uniformly smooth and glossy, showing numerous growth lines, which are continued right across the dorsal area. The three areas are hardly distinguishable, except that the lateral area is slightly raised. The posterior margin is finely serrated like a file where the valves are not worn. Four of the median valves have one broad wedged-shaped slit on each side; two valves have two slits on each side. Inside of shell

glossy white, sinus broad and shallow, sutural laminæ only slightly produced.

Girdle.—Under pocket lense appears whitish and felt-like. The margined fringed with white spicules, but under one-inch objective the girdle is seen to be crowded with masses of small irregular imbricating scales, which are finely striated.

Measurement.—Length, 26 mm.; breadth, 7 mm.

Habitat.—St. Vincent's Gulf; dredged by Dr. Verco.

Remarks.—This species is much broader in proportion to its length than *juloides*, the first valve being the broadest and very rounded, the width being fairly maintained to the sixth valve inclusive. Valves seven and eight taper rapidly, the latter being almost pointed. It is also easily distinguishable from *juloides* and *Pilsbryanus* by the anterior valve being longitudinally much shorter, the creamy white colour, and the densely irregularly scaled girdle. I am indebted to Dr. Verco for specimens of this and the following species.

Calloehiton rufus, *sp. nov.* Pl. i., figs. 2*a*—*g*.

General Appearance.—Shell oval, width three-fifths of total length, carinated, side slopes very curved. *Colour.*—Uniformly bright terra-cotta red, both shell and girdle, with the exception of a small white spot on dorsal area of valves three to eight, and the lateral area of valve seven, which is pure white; from this valve a white line traverses the girdle; also the four first valves have a light spot on the posterior margin.

Anterior Valve.—Under pocket lense quite smooth, with the exception of a few concentric growth lines. Megalospores are very distinct under compound microscope. Slits 11, teeth crenulate, which appearance is caused by the slight projection of the props. The spongy character of the eaves is continued in the slits between the teeth.

Posterior Valve is almost equally divided into two areas, the dorsal, or central, broadly wedge-shaped, traversed by eight longitudinal strongly raised ribs, similar to those of the pleural areas of the median valves. Mucro median, although shallow, decidedly more prominent than in *C. platessa.* Posterior area smooth, decidedly raised at the junction with the dorsal area. Slight concentric growth lines are discernible.

Median Valves.—Lateral area much raised, slight growth lines; also two or three shallow vertical sulci just distinguishable. Densely pitted with megalospores, which are very distinct. Pleural area longitudinally ribbed with scimitar-shaped riblets. The pits between are very deep where they join the lateral area. Dorsal area is raised, wedge-shape, divided from the pleural area by a deep spindle-shaped pit, tapering off into a curved groove at

anterior margin. A small white spot on valves three to eight. Slightly beaked. Under one-inch objective this area is closely ribbed with wavy longitudinal riblets. Slits two each side, eaves very spongy, teeth propped.

Girdle.—Broad, under pocket lense leathery, same red colour as valves, fringed at margin. Under one-inch objective is seen to be densely clothed with evenly packed, long, linear scales or spicules. These are arranged in rows, the apices curving across to the next row.

Measurement.—Length, 16 mm.; breadth, 10 mm.

Habitat.—Dredged St. Vincent's Gulf by Dr. Verco; one specimen only.

Remarks.—In general appearance this species closely resembles the bright red form of *Chiton tricostalis*, but on closer inspection the sculpture is seen to be widely different. The ornamentation in some respects approximates to *Callochiton platessa*, but that species is much more strongly pitted or decussated, and the longitudinal scimitar-shaped sulci are absent; also it is more strongly beaked than the species now described. Only one specimen has been obtained, and only the insertion plates of the first two valves have been examined.

Definition of a New Species of South Australian Polyplacophora.

By M. M. Maughan.

[Read September 3, 1900.]

Chiton oruktus, *sp. nov.* Pl. i., figs. 3*a*—*g*.

General Appearance.—Shape oblong, oval, very elevated, carinated, side slopes steep and slightly curved. Shell sloping back from about valve five. *Colour.*—Greyish green, mottled with olive. Anterior valve slightly lighter in colour than the rest. Dorsal areas tipped with reddish tinge. Girdle same colour as valves, with dark olive stripe opposite each lateral area, and at intervals round anterior and posterior valves.

Anterior Valve.—Steep, almost smooth, but showing scarcely perceptible radial costæ, and under the lense concentric wrinkles, faintly imbricating. Slits eight.

Posterior Valve.—Small, about half width of valve three. Mucro anterior. Posterior slope nearly straight. Posterior area ornamented with faintly imbricating concentric wrinkles like the lateral areas of other valves. Immediately in front of this area are the deep wedge-shaped pits described below. Slits eight.

Median Valves.—Dorsal area beaked, merging into the pleural area, faintly wrinkled with what appear to be growth lines. The marked feature of this shell is the row of about 12 parallel, very short, deep, wedge-shaped pits in the pleural areas, beginning from the edge of the lateral areas. They make an angle of about 120° with the direction of the transverse growth lines. Lateral areas are elevated with very low, flat, longitudinal, faintly imbricating divisions. Slits 1.1. Insertion plates with pectinated sinus broad, denticulated with 12 slits. A strong triangular rib, with apex at the posterior margin of the insertion plate, is seen inside of each of valves two to seven. Colour of articulamentum greenish white.

Girdle.—Scales smooth, wide, and very obtuse at apex.

Measurement.—Length, 20 mm.; width, 10 mm.

Habitat.—McDonnell Bay; found by Dr. W. G. Torr, to whom I am indebted for specimens.

EXPLANATION OF PLATE I.

a. Dorsal view of entire shell.
b. Anterior valve.
c. Median valve.
d. Posterior valve.
e. Anterior valve showing teeth.
f. Portion of girdle magnified.
g. Insertion plate, median valve.

Fig.
1. Ischnochiton (Stenochiton) pallens.
2. Callochiton rufus.
3. Chiton oruktus.

Descriptions of New Genera and Species of Australian Mollusca (chiefly Tasmanian).*

By Professor Ralph Tate and W. L. May.

[Read October 2, 1900.]

Lampusia nodocostata, *spec. nov.*

Shell fusiform, rather slender, light-brown. Whorls (excl. proto-conch) four and a-half, convex, but obtusely angulated in the middle. Embryonic whorls incomplete, one and a-half preserved, smooth, rounded, relatively large (2·75 mm. diam.), suggestive of a styliform proto-conch similar to that of *L. exarata*, but on a larger scale.

Costæ subacute, with about three nodulations on the anterior half; six intervariceal costæ. Varices similar to the costæ, except that they are stouter; seven in all.

The spiral ornament consists of crowded threads, which are obscurely granulated; 24 on the penultimate whorl, of which three on the anterior half of the whorl are broader, and originate the nodulations on the costæ.

Last whorl about two-thirds the total length of the shell. The costæ are extended to the base, and the nodulation is continued below the periphery, corresponding with the intercrossing of six broader spiral threads, which are regularly disposed; the interstitial spaces between the broader threads are occupied by about eight smaller spiral threads.

Aperture quadrately oval; beak short, considerably upturned. The columella is smooth, and the outer lip is not dentate (the shell is probably not full grown).

Length, 31; breadth, 16; length of aperture and canal, 17 mm.

East Coast, Tasmania; two examples (*W. L. May*).

This species appears from the description and figures of *Triton tenuiliratus*, Lischke, Japan Meer-Conch., to be closely related thereto; but differs by details of ornament. *T. granulatus*, Dunker, is the only Australian species of the genus unknown to

* It is anticipated that figures of the new species and other unfigured Tasmanian species will be published early next year by the Linnean Society of New South Wales, to accompany a paper entitled "Revised Census of the Marine Mollusca of Tasmania," as time does not permit of their preparation to accompany this issue.

us, but as it is said to belong to Section Simpulum, whereas our species belongs to Gutturnium, the two must be regarded as distinct.

Cantharus kingicola, *spec. nov.*

Shell fusiformly oval, somewhat solid; *colour* opaque-white, except the summit, which is pale-orange.

Nucleus small, of two and a-half smooth, convex turns. *Spire-whorls* five, slopingly convex, subangulated towards the anterior by reason of the greater volume of the axial costæ. The *axial* ornamentation consists of close, elevated, rounded, straight costæ (twelve on the penultimate whorl), which thicken very rapidly as they approach the front suture (there they are about twice as wide as the interspaces). The *spiral* ornament consists of roundly compressed valid liræ (seven on the penultimate whorl) which cross the costæ, and of a sutural adpressed band.

Body-whorl convex, contracted anteriorly; there are twelve axial costæ, which are most developed at the rounded periphery, and become evanescent in front of it; there are about 15 spiral liræ, fairly regular, with occasional interstitial threadlets, and there is a sutural band.

Aperture elongately oval, half as long as the shell. Outer lip uniformly convex, varicosely dilated; acute, prominent lines within. Columella concavely arcuate, not plaited at the base. Beak short, rather wide, slightly upturned.

Length, 18; width, 9 mm.

King Island; two specimens.

Marginella crateriola, *spec. nov.*

Roundly obconic, somewhat bullæform, having the general features, as regards shape of a *Bullinella*, translucent, shining, bluntly rounded posteriorly (where the shell is widest), rapidly attenuating to the subacute front. Spire concealed and sunken to form a shallow crateriform depression.

Outer lip slightly thickened, smooth on the inner margin. Columella with two closely approximate large plaits; the anterior one the larger, terminating in a slight anterior emargination.

Length, 2·3; width, 1·5 mm.

D'Entrecasteaux Channel, Tasmania; 10 fathoms (*W. L. May*), two examples.

This species is conspicuous by its impressed spire, which separates it from all other Marginellidæ.

Marginella multiplicata, *spec. nov.*

Shell minute, rather solid, shining white, having much the shape of *M. Isseli*. Spire concealed. Aperture equalling the total length of the shell, but not extending much beyond the

summit; slightly arched, narrow, of nearly equal width till it slightly widens at the everted front. Outer lip thickened and well-margined all round, smooth within. Columella with one strong oblique plait at the front, which is succeeded on the pillar by seven transverse thread-like plaits; the columella-plait runs out to form the left margin of a shallow and wide effuse notch.

Length, 1·6: width, ·95 mm.

Tasmania, *W. F. Petterd!*.

This species much resembles *M. Isseli*, Nevill (*M. nympha*, Braz.), but it has more plications, and the outer lip is smooth; from *M. cymbalum*, which is a much larger shell, it is more narrowed anteriorly, and the plications of a different type. *M. Hallii* is truncated at the apex. *M. alternans* appears to resemble it, and though they have the same number of plications, yet their dispositions are so distinctly different that we must regard them, in the absence of actual comparisons, as distinct.

Marginella biplicata, *spec. nov.*

Shell small, cylindroid, pellucid, straw-coloured. Spire very obtuse, of three and a-half whorls, scarcely exserted. Aperture narrow-elongate, widening to the front, obtuse-angled posteriorly. Outer lip scarcely thickened: not ascending on the spire, its junction marked by a slight retiring angle; smooth on the inner side. Columella with two strong oblique plaits at the front—the posterior one is slightly the stronger; anterior emargination well-defined.

Total length, 4; greatest width, 2 mm.

Port Esperance, Tasmania; in 24 fathoms, 2 exs. (*W. L. May*).

It is nearest to *M. stanislas*, but is shorter and relatively broader, and the apex is more obtuse, whilst the most prominent differences are in the smooth inner lip and biplicated columella.

Marginella Simsoni, *spec. nov.*

M. denticulata (pars), Tate, non Conrad.

M. minima, Petterd, non Sowerby.

Shell pyriform, contracted in front, shining, white. Spire immersed, though not wholly concealed. Aperture as long as the shell, slightly everted in the young. Outer lip thickened, smooth. Columella with about ten plications, decreasing gradually in size from the front.

Length, 1·9; greatest width, 1·3 mm.

Tasmania and South Australia.

M. minima, Petterd, the type of which we have studied has a length of 1·4 and a breadth of 1·0 mm., and besides being smaller than *M. denticulata* it is slightly more attenuated to the front, and the outer lip is not thickened; differences which may be attributed to a young age.

The description of *M. denticulata*, Tate, is inapplicable, because it was based on two species—one specimen supplied the characters "denticulated margin and four-plicate columella" with exsert spire (it is a young micromorph of *M. Strangei*); the other, "pyriform shape and immersed spire," with a smooth outer lip and multiplicate columella, is *M. Simsoni*.

Marginella Mayii, Tate *(spec. nov.)*.

Shell of an elongately oblong-oval shape; the body-whorl rather rapidly tapering from the rounded shoulder to the base; spire obtusely conical, blunt at the apex.

Test thick, smooth, polished. General colour chestnut-brown, relieved on the spire by lighter colour at the posterior sutures; on the last whorl it is interrupted by a narrow light-coloured band at about the posterior one-third, and also at the base; the dark coloured bands are deeper tinted at their margins; the thickened aperture, all round, is opaque white.

Whorls five, nearly flat; the last convex posteriorly, and of an even slope thence to the snout.

Aperture three-fourths the total length of the shell, narrow, the outer lip making an acute angle posteriorly; about 2 mm. wide medially, narrowing thence to the front to about half. Outer lip thickly and broadly callously thickened on the outside, ascending to about one-half the height of the penultimate whorl; denticulated within (except towards the extremities). Columella stoutly four-plaited, plaits subequal, the posterior pair more transverse than the anterior pair.

Total length, 12; length of aperture, 9; maximum width, 6 mm.

Frederick Henry Bay (type) and East Coast of Tasmania (*W. L. May*); Derwent Estuary (*E. Harrison*).

Among Australian congeners *M. Mayii* comes near to *M. pygmæa*, but is of very much larger size; it is, moreover, more attenuated anteriorly, and especially differs by its outer lip variced outside and denticulated within; also near *M. Allporti*, which it resembles in its denticulated outer lip and coloration, but differs by longer and attenuated spire and larger size.

I have much pleasure in adopting for this shell the name of my coadjutor, under which name it has been distributed [*R. Tate*].

Marginella ovulæformis, *spec. nov.*

Shell minute, ovate, attenuated at the ends, regularly convex, white, shining. Spire concealed, the aperture extending backward beyond it.

Aperture narrow, arcuate, bluntly rounded posteriorly, slightly expanding to the front, ending there in a slight emargination, which is curved to the left. Outer lip thin,

blunt-edged, edentulous. Columella with a strong terminal spiral plait running out to form the left margin of a deep and somewhat effuse canal.

Length, 1·5; greatest width, 1 mm.

Tasmania (*W. F. Petterd!*).

This species and *M. lubrica* are characterised among recent Marginellidæ by their uniplicate columellas, but that type has an ancestral form in an Eocene species at Muddy Creek. In shape, *M. ovulæformis* is somewhat intermediate between *M. Flindersi*, with two plaits, and *M. Hallii*, with seven plaits; *M. Isseli* is also near, but it has four plaits, and is not so attenuated at the ends.

Donovania fenestrata, *spec. nov.*

Shell moderately stout, narrow lanceolar-fusiform, pale-fawn colour. Pullus papillary of three, inflatedly convex smooth whorls, somewhat rapidly diminishing in size. Spire-whorls five and a-half, moderately convex, separated by a deeply impressed suture; ornamented with spiral and transverse ridges of equal strength, which produce square deep fenestrations; there are five spiral ridges, and on the penultimate whorl there are about twenty axial ones.

Last whorl convex, with seven spiral ridges to the periphery—three on the concave area below it, and four on the snout.

Aperture roundly oblong, higher than wide; outer lip entire, vertical in contour, simple, ridged inside, corresponding with the external furrows. Columella arched to its base, thence running out abruptly and obliquely to form the left boundary of a short, wide, slightly up-turned snout.

Length, 8; width, 2·75; height of aperture, 2·75 mm.

East Coast of Tasmania (*W. L. May*).

Natica Tenisoni, *nom. mutand.*

N. nana, Ten.-Woods, P.R.S., Tasm., 1876, p. 149, non Möller.

Long Bay; Ten.-Woods.

Thylacodes caperatus, *spec. nov.*

Shells agglomerate, reddish brown; whorls embracing and reciprocally adherent, forming a short broad cone, ornamented with close-set, rounded, irregularly-sized, transverse ridges; suture distinct. The free tubular portion long, much narrowed, irregularly bent, circular in section; ornamented as the rest of the shell.

Diameter of base, 4 to 5; height of cone, about 2; length of tube, up to 10; its diameter, 1 mm.

Tamar Heads, Tasmania; *W. F. Petterd!*.

Animal unknown, but from its resemblance to some Tertiary species in Australia it is associated with *Thylacodes* rather than with *Vermetus*.

Turritella Atkinsoni, *spec. nov.*

This species was described as new by Tenison-Woods in 1877, under the name of *T. Tasmanica*, which makes double employment with Reeve's species; and in the following year it is quoted by him in his "Census" as *T. Tasmaniensis* (a typographical error). It would appear that he had subsequently admitted the need of a new specific denomination, and the shell has been locally known as *T. Atkinsoni*. Though its authorship is not traceable in print, we utilise it with ready willingness.

T. Woods's description is rather misleading, as it implies a bicarinated species, whereas there are four large keels on the penultimate whorl—the peripheral one is the largest, the posterior two smaller, and the anterior one is nearly as large as the peripheral one, with or without a slight band at one or both sutures. Its closest relative is *T. austrina*, Watson, of Kerguelen Island; but the Tasmanian shell has interstitial spiral striæ, and the sinus-lines are deeper and wider.

Long Bay, *Ten.-Woods;* Port Esperance, *W. L. May.*

T. Godeffroyana, Donald, Mal. Soc., IV., p. 53, t. 5, f. 6-6*a*, 1900, which is founded on a single specimen, may be an individual variation; it has *three* strong keels.

Scalaria (Acrilla) minutula, *spec. nov.*

Shell minute, moderately thick, cylindroid-turreted. Spire-whorls five, pale yellow-brown, flatly convex, and slightly angulated in the posterior-third, separated by a linear suture, bounded anteriorly by a spiral thread; ornamented by slender slightly oblique ribs, about 15 on the penultimate whorl, which are somewhat bent at the angulation, the interspaces are as wide, and smooth. The translucent-white apex consists of a convex, relatively wide, three- to four-carinated whorl, and of a small hemispheric tip.

Last whorl flatly convex to the acute margin defining the base, base smooth.

Aperture oblong, somewhat effusively expanded at the front; peristome incomplete; outer lip thin, shortly insinuate at the suture; columella thin, nearly straight.

Length, 2; breadth, ·57 mm.

Tasmania, *W. L. Petterd!;* W. Coast of S. Australia, *R. Tate!;* Victoria, *J. H. Gatliff!*

Eulima inflata, *spec. nov.*

Whorls slightly irregularly convex; penultimate whorl somewhat contracted; last whorl much inflated, regularly convex. Aperture relatively small, roundly oval, hardly oblique. Outer lip not retreating at the sutural margin.

Length without apex, 6·25; width, 3 mm.

This species resembles *E. Tryoni*, but is thinner, and is a longer shell for the same number of whorls—the whorls are more convex; whilst *Tryoni* has a more oblique aperture, narrower base, which is oblique on the left side.

In the absence of the tip, it is uncertain to place the species in the Section Mucronalia, to some species of which it has some resemblance.

North Coast of Tasmania; *W. F. Petterd!*.

Eulima Mayii, *Tate, spec. nov.*

Shell solid, white, highly polished. Spire with a slight apical twist from before backward, gradually tapering to an extremely attenuated tip. Whorls fourteen, flat. Aperture elongate-oval, or a little higher than wide, slightly oblique; outer lip retreating from the middle line to the suture.

Length, 7·75; width, 2·5: height of aperture, 2·25 mm.

Seems to resemble *E. intermedia*, but has the last whorl approximately about half the length of the shell, instead of one-third, as in the Mediterranean species.

I employ the species-name in compliment to my coadjutor, under which it has been known in manuscript among Tasmanian collectors [*R. Tate*].

East Coast of Tasmania, south of Swansea; *W. L. May*.

Eulima Tryoni, *spec. nov.*

E. Tenisoni (pars), Tryon, Man. Conch., VIII., t. 68, f. 16, non p. 269; *E. Tenisoni*, Tate, T.R.S., S. Aust., XXII., 1898, p. 81.

This is the shell figured by Tryon as *E. Tenisoni*, but it is a different species to *E. micans*, T.-Woods, to which he applied that name. It is related to *E. latipes*, Watson, which has a broader base, patulous outer lip, and has a somewhat rapid increase of growth of the spire.

Common in S. Australia; also Victoria; and at Derwent Estuary, Tasmania, *W. L. May*.

Stylifer Petterdi, *nom. mutand.*

S. robusta, Petterd, Journ. Conch., 1884, p. 140, non Pease, 1860.

Leven Heads, Tasmania.

Syrnola Harrissoni, *spec. nov.*

Shell lanceolate, thin, hyaline, smooth, white. Apex heterostrophe, small, of one and a-half whorls. Spire whorls five, rapidly increasing in size, nearly flat, suture impressed (the specimens examined are more or less corroded, and present, in consequence thereof, a shoulder at the posterior suture).

Aperture elongate-oval, somewhat expanding anteriorly; columella with a very prominent spiral plait.

The shell is variable in its proportionate dimensions. The figured specimen has length, 3; width, 1; a large example has breadth, 1·5; length of aperture, 2; estimated length, 5·5 mm.

Off Brown's River, Tasmania, *E. Harrisson!*.

Syrnola Petterdi, *nom. mutand.*

Obeliscus Tasmanicus, Petterd., Jour. Conch., 1884, p. 40; non *S. Tasmanica*, Ten.-Woods (Styloptygma), 1877.

Tasmania.

Syrnola punctospira, *spec. nov.*

Shell minute, acuminately oval, rather thin, sub translucent. Spire whorls three and a-half, convex, of rather rapid increase, sculptured by forward-curved striæ and distant indistinct lineations; suture impressed. Pullus of one and a-half hyaline, exsert whorls continued into an erect loop with an immersed tip; its last whorl graduating in size to the first spire-whorl, somewhat inflatedly rounded and sculptured by ten spiral rows of punctures. Aperture elliptic-oval, front lip slightly effusively dilated on the left; columella with a large twisted plait.

Length, 2·25; greatest width, 1·0 mm.

George Bay, Tasmania, *W. F. Petterd!*.

A minute shell, with well-rounded and rather rapidly-increasing whorls, with a distinctive sculptured pullus. Several examples.

Odontostomia deplexa, *spec. nov.*

Shell minute, imperforate, moderately stout, smooth, shining, white, sculptured with microscopic growth-lines (without spiral striæ). Whorls five, of moderate increase, convex, slightly protuberant at the posterior suture. Pullus concealed, except the papillary-like tip of the loop.

Aperture oval, columella with a strong transverse fold at its origin.

Length, 3; width, 1·1 mm.

Most like *O. lævis*, but the whorls are more convex, shell more cylindroid, besides being much smaller.

Frederick Henry Bay, Tasmania (*W. L. May*); S. Australia (*R. Tate*); Victoria (*J. H. Gatliff!*).

Odontostomia varians, *spec nov.*

Shell small, acuminately oval, moderately stout, dull white (dead). Pullus pellucid, smooth, papillary as a whole, forming a small lop-sided bend. Whorls five, flatly convex, separated by a broad deep suture; sculptured by four deep narrow spiral grooves, separating flat interspaces of dissimilar width (the first

three are relatively wide, the second and third of about the same width, but wider than one; the fourth is a slender lineation sunk in the sutural canal). The first and second ligatures are broken-up into blunt, straight, axial ridges, separated by about as wide indented interspaces.

Aperture oval, peristome thin. Columella slightly arched, forming a blunt roundly-effuse angle at the front; thinly and sparingly exsert to form an umbilical chink; there is a slender transverse plait at its summit.

Length, 3; width, 1·4 mm.

Of six examples two are in accord with the foregoing description. A third and fourth, which are translucent horn-colored, have the first and second ligatures studded with small granules; whilst the fifth and sixth, also translucent, are without ornament, and the spiral furrows are feebly developed and barely traceable on the body-whorl.

D'Entrecasteaux Channel, Tasmania (*W. L. May*).

Genus Pseudorissoina, *Tate* and *May*.

Type:—*P. Tasmanica*, Tenison-Woods (*Stylifer*).

Apex sinistral, spire and aperture like Rissoina (*e.g.*, *R. nivea*).

The unique species was originally described as belonging to *Stylifer;* Tryon, who figures an authentic specimen, says of it—"Is it not rather an *Eulima?*" Our study of the species confirms Ten.-Woods' statement that the apex is sinistral—indeed, whilst having the spire and aperture of a *Rissoina*, like *R. nivea* (the shell is, however, smooth), it has the heterostrophe loop-like nucleus of *Eulimella*. Such a combination of characters seem to be unprovided for in the families Pyramidellidæ or Rissoidæ, hence the new generic designation. Briefly, this new genus is a Pyramillid with a Rissoina aperture or a Rissoinid with a Pyramilloid nucleus. The higher value of the nuclear character in classification induces us to place it, in Pyramidellidæ, near *Eulimella*.

Turbonilla admiranda, *nom. mutand.*

Elusa bifasciata, Ten.-Woods, P.R.S. Tasm., 1877, p. 150; non *Turbonilla bifasciata*, A. Adams, 1861.

T. festiva, Angas, P.Z.S., 1877, t. 5, f. 4; non Folin, 1867.

Victoria, Tasmania, and N.S. Wales.

Rissoia (Apicularia) demessa, *spec. nov.*

Shell minute, strong, pale-brown. Spire-whorls four, convex, ornamented with narrow rounded oblique ribs (about fourteen on the penultimate), more prominent medially, and attenuated at the sutures; also with spiral grooves, which are about as wide as the intervening flat threads (about eight on the penultimate); on

the last whorl the slender costæ stop short at the periphery. Pullus of smooth whorls.

This species is closely related to *R. trajectus*, Watson, but differs by more elongate shape, arched ribs, and rounded whorls; also to *R. Strangei*, Braz., which has closer and stronger ribs, fewer spiral striæ, and the shell short and stout.

Tasmania.

Rissoia (Apicularia) apicilirata, *spec. nov.*

Elongate-conic, thin, yellow-fawn, smooth, shining. Pullus hyaline, turbinate, two-whorled, ornamented with three, spiral, simple, relatively broad and high keels. Whorls three, slightly bicarinated, the posterior slope somewhat concave, the anterior slope steeper and shorter; ornamented by transverse slender ridges (about twenty on the penultimate), which are oblique on the posterior slope, vertical thence to the front suture; there is a spiral thread at the posterior suture, and a threadlet near the anterior rows; two spiral rows of small nodosities occupy the near middle-third of the whorl.

Periphery of last whorl with four riblets crossed by costulæ, and there are a few others on the base which gradually decrease in size.

Aperture oval; peristome entire, thin.

Length, 2·2; width, 9 mm.

D'Entrecasteaux Channel, Tasmania.

This species is unique in the section by reason of its ornate pullus.

Rissoia (Pusillina) discrepans, *spec. nov.*

Shell oval-conic, thin, greyish, pale rose-tinted at the apex.

Pullus somewhat hemispheric of two smooth whorls. Spire-whorls four, nearly flat, suture impressed; ornamented by numerous slender subacute axial ridges, interstices smooth. Last whorl subangulated, the axial costation evanescent towards the anterior part; an indistinct lineation is at the periphery, as also one above and one below, all in near contiguity; base finely striated radially.

Aperture oval, outer and inner lips thinly callously joined; outer lip thin (slightly varicosely dilated behind, front lip with a slight insinuosity—these features are probably the result of an injury during life). Columella slightly exsert, margining a linear umbilical chink.

Length, 3; width, 1·6 mm.

D'Entrecasteaux Channel, Tasmania.

The ornament and shape, in combination with the angulated base, distinguish this species from all figured species.

Rissoia (Amphithalamus) Simsoni, *spec. nov.*

Pupiform, strong, shining, white, tinted with pale-chestnut. Whorls four, flatly convex, sculptured with microscopic oblique striæ; suture linear. Apex hemisphæric of one and a-half whorls. Last whorl somewhat flattened on the ventral face. Aperture oval; peristome continuous, adnate to the parietal wall. Resembles *R. dissimilis* on a large scale.

Length, 4·5; width, 1·5 mm.

Species-name in compliment to our friend and co-worker, Mr. Auguste Simson of Launceston.

Derwent Estuary, Tasmania *(W. L. May)*; also Port Fairy, Victoria *(Rev. T. Whan!)*.

Rissoia (Cingula) rubicunda, *spec. nov.*

Shell minute, elevated conic, imperforate, moderately thick; varies in colour from pellucid-brown to opaque-white.

Pullus obtuse, of one and a-half turns. Spire-whorls four, moderately convex, widest near the anterior suture (some examples show a tendency to imbrication), smooth, and sculptured with growth-lines. Suture linear, distinct. Last whorl rather depressed at the suture, rounded at the periphery, a little contracted at the outer lip.

Aperture rotund, chestnut-coloured in the interior; peristome entire; outer lip thin; columella lip slightly exsert, margining a false umbilical chink.

Length, 2·5; width, 1·0 mm.

Derwent Estuary, Tasmania *(W. L. May)*; many examples.

This may prove to belong to *Hydrobia*, when the animal has been studied.

R. perexigua, *nom mutand.*

Rissoia minutissima, Ten.-Woods, P.R.S. Tasm., 1878, p. 122; non *Rissoia minutissima*, Michelin, "Gen. Rissoia."

Rissoia (Nodulus) pellucida, *spec. nov.*

Shell minute, obliquely oval, somewhat stout, translucent-white, smooth, shining, imperforate. Pullus small, obtuse. Spire-whorls three and a-half, rapidly increasing, slantingly convex, without visible ornament or sculpture. Aperture roundly oval; peristome thick, continuous.

Length, 1·2; width, ·75 mm.

Frederick Henry Bay, Tasmania (*W. L. May*).

This species differs from other members of the section by its Littorina-like shape; however, the following species in Section Cingulina offer some comparisons:—It has the outline of *R. hyalina*, which possesses spiral raised striæ and delicate growth-lines, and it is more obliquely oval than *R. littorinæformis*.

Rissopsis buliminoides, *spec. nov.*

Shell small, cylindroid, thin, opaque-white. Whorls six, flatly convex, sculptured with faint axial striæ of growth; suture linear, but well-defined. Pullus hyaline, depressedly rounded, forming a small abrupt papillary summit, tip immersed. Aperture oval; peristome entire, the callous growth on the parietal wall somewhat explanulate; columella with a slight torsion over a minute umbilical chink.

Length, 4·25; breadth, 1·3 mm.

Federick Henry Bay, Tasmania, 10 fathoms, *W. L. May.*

Rissopsis consobrina, *spec. nov.*

Elongate, turreted, hyaline (in a fresh state), with rounded whorls and a deep suture, sculptured with curved growth-lines. Aperture elongate-oval, somewhat explanulate, columella-lip very thin and exsert.

Its turreted form, rounded whorls, and elongate-oval aperture distinguish it from *R. buliminoides.*

Length, 3·5; width, 1·0 mm.

Federick Henry Bay, Tasmania, common, *W. L. May.*

Cyclostrema porcellana, *spec. nov.*

Shell oval-conic, moderately stout, smooth, shining, opaque-white. Spire-whorls three and a-half, convex, sloping gently from the posterior one-third, more abruptly to the anterior suture, faintly marked by oblique striæ. Pullus of one and a-half whorls, translucent, depressedly convex. Periphery of last whorl roundly angulated. Aperture roundedly-oval, oblique; peristome incomplete; outer lip rather thin; columella slightly exsert, but not reflected over a minute umbilicus. Six examples.

Length, 1·8; breadth, 1·3 mm.

This species is more conic than such related forms of Tubiola as *C. australe, C. contabulatum,* and *C. micron.*

Frederick Henry Bay, Tasmania *(W. L. May).*

Zidora Lodderæ, *nom. mutand.*

Z. Tasmanica, Hedley, P.L.S., N.S. Wales, 1900, p. 93, three woodcuts; non Beddome, 1883.

This species is closely related to the Japanese *Z. reticulata;* and judging from Reeve's figure of that shell, the Tasmanian congener differs by relatively greater width.

The shell which Tate rightly attributed to Beddome's species, and described under the name of *Z. Legrandi,* T.R.S., S. Aust., XVIII., p. 118, 1894, differs from other known species by its apex situated far within the vertical plane of the posterior margin.

Tasmania *(Miss Lodder);* N.S. Wales (apud *Hedley).*

Nacella Tasmanica, *nom. mutand.*

N. parva, var. *Tasmanica*, Pilsbry, "Nautilus," 1895.

Frederick Henry Bay, Tasmania *(W. L. May).*

Cadulus (Gadilia) spretus, *spec. nov.*

Shell small, of medium proportion, well-curved, variegated (in some specimens) with translucent and opaque-white rings and encircling bands. Surface smooth, with fine obliquely annular grooves or lines, without traces of vertical striæ.

Apertures circular, transverse. Tube suddenly contracted quite near the oral aperture, but exhibits a slight dilatation at the end.

Shell most like *C. panamensis*, Sharp and Pilsbry, but seems to grow more rapidly, has greater breadth throughout, and is more curved.

Length of shell, 5·5; diameter of larger aperture, ·7; of the smaller aperture, ·3 mm.

Port Esperance, Tasmania, in 24 fathoms *(W. L. May).*

Cyamium mactroides, *spec. nov.*

Shell mactra-like, minute, equivalve, nearly equilateral, somewhat thick, smooth, and shining; of a whitish colour, and partially brown-tinted, moderately convex. Surface concentrically striated, obsoletely radially ridged, ventral and anterior margins crenulated within. Umbos small, approximate, slightly directed forwards, a little posterior. Dorsal line about equally inclined, the anterior margin curved, the posterior margin truncatedly rounded, ventral margin nearly straight.

Hinge-line arched and relatively deep. Left valve with a posterior marginal ligamental pit, in front of which is a central cardinal tooth with two strong equal divaricating branches, and an anterior oblique cardinal tooth. Right valve with two diverging cardinal teeth, the anterior one bifid at the tip.

Antero-posterior diameter, 2·05; umbo-ventral diameter, 1·8 mm.

Two pairs of valves, taken in life *(W. F. Petterd!).*

The reference of this little shell to *Cyamium* is because its dentition agrees with the emended description of the genus as implied by Bernard in Bull. Mus. Hist. Nat., 1897, p. 311.

Carditella delta, *spec. nov.*

Shell equilateral, subequivalve, trigonal, compressed with produced straight pointed umbones. The dorsal lines slope very rapidly from the umbones which are in contact; the post-dorsal margin slightly arched, the anterior-dorsal straight; the lunule and escutcheon occupy deep elliptical depressions, angulated on the margin. The ventral margin is arched, and is distantly crenulated within.

There is a thin brown epidermis; the ornament consists of concentric lines and a few distant growth-folds and obscure radial lines.

Umbo-ventral diam., 2·25; antero-posterior diam., 2; sectional diam., 1·25 mm.

Derwent Estuary, Tasmania (*W. L. May*).

Comes nearest to *C. polita*, Tate, an Eocene species, but is not produced anteriorly. It differs from *C. Atkinsoni* by its acutely trigonal outline, and is not so convex.

Carditella pectinata, *spec. nov.*

Triangularly oval, inequilateral, rather convex. Antero-dorsal margin straight and steeply inclined; post-dorsal margin convexly sloping to the narrow rounded posterior side; ventral margin slightly curved, distantly crenulated within.

Umbones obtuse, prominent, approximate, situated considerably in front of the centre.

Colour yellowish-brown. The ornament consists of numerous (fifteen or more) radial broad ridges (most conspicuous anteriorly), separated by linear sulci; and intersected by growth-lines.

Umbo-ventral diam., 1·5; antero-posterior diam., 1·5; sectional diam., 1 mm.

Derwent Estuary, Tasmania (*W. L. May*).

Genus Thraciopsis, *nom. mutand.*

Alicia, Angas, 1867, non Johnson, 1861.

Type :—*T. angustata*, Angas (sp.)

New South Wales, Tasmania, and South Australia.

On the Occurrence of Marine Fossiliferous Rocks at Kerguelen Island.

By Professor Ralph Tate.

[Read September 3, 1900.]

Plates II.—III.

Introduction.

Kerguelen Island was discovered in 1772 by the commander of a French vessel—Ives Julian de Kerguelen Tremaric. A little later it was visited by Captain Cook. Since then it has been visited by four scientific expeditions, the first under the command of Sir James Ross in 1840; the second, that of the Challenger Expedition in 1874, and the two Transit of Venus Expeditions, 1874-75, one British, the other United States of America.

The island is in about 49° South latitude, is 100 miles long, and about 50 miles wide, and is about 3,500 miles S.E. from the Cape of Good Hope, and 3,000 miles from the extreme west coast of Australia.

Ross says of it, that it is one of the most barren spots on the earth at the same distance from the pole. One of the names by which it has been known to geographers is very appropriate—Desolation Island, which was given to it by Captain Cook. Sir Joseph Hooker describes it:—"The island presented a black and rugged mass of sterile mountains, rising by parallel steppes one above another in alternate slopes and precipices, terminating in frightful naked and frowning cliffs, which dip perpendicularly into the sea. The snow lying upon these slopes between the black cliffs gives a most singularly striped and banded appearance to the whole country, each band indicating a flow of volcanic matter, for the island is covered with craters, whose vents have given issue to stream upon stream of molten rock. These were worn all along the coast into abrupt escarpments, rendering a landing impracticable, except at the heads of the sinuous bays."

Kerguelen Island was visited in 1898 by Mr. Robert Hall, of Melbourne, and his collections of lichens, algæ, fungi, and rocks, which have been described by experts in the "Victorian Naturalist, vols. XV. and XVI.," have supplemented previous knowledge in the several departments. But these discoveries are vastly transcended by that relating to the presence of marine

fossiliferous strata; almost unique as regards high Southern lands.

My reading-acquaintance with the geology of the land-masses in high southern latitudes may be for the most part summarised in the following words of Captain Hutton, F.R.S., "On the Origin of the Fauna and Flora of New Zealand," Presidential Address, Phil. Inst., Canterbury, 1884:—"From what is known of the geology of the Antarctic Islands, it appears that all are volcanic, except South Georgia, which is part of an old slate-mountain range." Nevertheless, Captain Hutton has overlooked the observations of Dr. Kidder, which indicate the occurrence of stratified deposits in Kerguelen Island; who remarks in his "Contributions to the Natural History of Kerguelen Island made in 1874-75," Bull, U.S. Nat. Mus., 1876:—"The main rocks are basalt and dolerite. The streams had cut their way deeply in places, exposing extensive surfaces of rock, but diligent search failed to disclose any stratified or fossiliferous beds" in the southern part of Kerguelen Island. "At the northern end of the island, however, in the neighbourhood of Christmas Harbor, stratified rocks are abundant, with extensive deposits of coal of poor quality, and contain many trunks of petrified trees," p. 34.

Position, Nature, and Fossil-contents of the Marine Deposit.

From Mr. Hall's field-notes and sketches the position of the fossil development occupies a depression on the west side of the peak known as Cat's Ears; it is squeezed in between eruptive masses at a steep slope, and attains to an elevation of 826 feet. The stratum seems as if it had been upthrusted from its horizontal position by the eruption of the volcanic mass which is crowned by Cat's Ears.

The rock is a fine-grained friable sandstone of a grey colour, somewhat dappled with rust-coloured grains. About 50 lbs. weight of the rock was submitted to it; it is richly prolific in fossils, constituting for the most part a lumachelle. However, the number of species is only fourteen, the Chiones and Turritella being the only ones occurring abundantly. They consist of Natica one sp., Turritella one, Chione three, Gari one, Mytilus two, Polyzoa two (impressions on the casts of *Chione*), Balanus one, Spirorbis one (2.25 mm. diam., whorls 2½), Serpula two (one fasciculated, tubes 2.5 mm. diam, the other solitary, long, and vermiculate).

The facies of the fauna is Tertiary, and may belong to any part of it, because, as regards the well-defined species of mollusca, not one is referable to living creation—certainly not in reference to

the existing fauna of Kerguelen Island and other similar Southern positions. The *Turritella* resembles *T. Hookeri* from the Antarctic, without locality; the *Natica* has no near analogue, and the genera *Chione* and *Gari* are not represented in high Southern latitudes; nevertheless, it is not improbable that the two species of *Mytilus* may belong to recent species.

The fauna indicates nothing specialised, except that of distinctness of species, to separate it from that of a modern deposit; and in the absence of distinctive genera of Palæogene age, I must refer the deposit to Neogene without any subordinate assignment.

Notes on the Fossils.

Natica Tremarici, *spec. nov.* Pl. ii., figs. 4*a*-4*c*.

Shell depressedly hemispheric; whorls four and a half, marked with growth-lines, but without spiral sculpture. Aperture lunate. Umbilicus wide; a small callus is reflected over the upper portion of the umbilicus.

In shape this fossil species is like the recent *N. ampla* and *N. Incei* of the same size, but the spire is obtuse and less elevated than in *N. Incei*, more elevated than in *N. ampla*, and regularly convex below the suture; the umbilicus is somewhat similar to that of *N. ampla*.

Diameters, 19 and 12; height, 10 mm.

Turritella Hallii, *spec. nov.* Pl. ii., figs. 3*a*-3*b*.

Shell broadly conical, a little rounded at the basal angle and on the base. Apex not known. Whorls ten, biangulated, much constricted below, and more gradually contracted above.

The ornament consists of two strong keels, one at each margin of the side, dividing each whorl into three approximately equal widths; the space between the keels is flattish or slightly concave. In addition there are fine spiral threads, usually alternaternately large and small, six on the intercarinal space, and six on each of the sutural slopes.

Aperture quadrately oval, higher than it is broad; outer lip not preserved, though there are traces on the anterior part of the last whorl of curved growth lines, indicating a broad shallow sinus; columella somewhat arched and thickened (not dilated at the front).

Length, 39; breadth, 12·5; height of last whorl, 12 mm.

Among the few bicarinate species of the genus it makes some approach to *T. ambulacrum*, Sow., Tertiary in Patagonia and Chatham Islands, which has the whorls not so quadrate, and the encircling ribs are of unequal size. It simulates *T. Hookeri*, Reeve, an Antarctic species, but, judging by the figure, it is

narrower, with more numerous whorls. No details of ornament accompany the diagnosis. *T. austrina*, Watson, from Kerguelen, is somewhat broader, the whorls more numerous, not so quadrate, and the two carinating liræ not equally disposed.

Chione permagna, *spec. nov.* Pl. ii., fig. 1.

Shell triangularly oval, very thick, somewhat heart-shaped, very inequilateral, depressedly convex. Umbones large, depressed, situated in about the anterior one-fourth.

Post-dorsal margin arched, gradually merging into the obliquely subtruncated posterior margin; post-ventral margin nearly straight, rapidly incurving to the rounded anterior margin; antero-dorsal margin cordately curved; inner margin of valve quite entire. Lunule broadly elliptic, shallow, its margins angulated.

Ornamentation of crowded depressed growth-ridges and lines, not raised into lamellæ; and on the dorsal-half by rounded radial threads with equidistant interstitial furrows, about thirty in a width of ten millimetres.

Antero-posterior diameter, 86; umbo-ventral diam., 79; sectional diam., 40. A larger and more orbicular example has ant.-post. diam., 95; umbo-ventral diam., 88.

This large ponderous shell is probably the largest in the genus, hence its specific name; it is distinguishable by its obliquely orbicular outline.

Chione Hallii, *spec. nov.* Plate ii., fig. 5.

Shell oblong-oval, moderately convex, somewhat thick, inequilateral; concentrically grooved, the depressed rounded intervening folds about two times as wide as the grooves, which are somewhat variable in width, from 16 to 20 in a width of ten millimetres near the ventral margin. Internal margin of valves quite entire.

Antero-posterior diameter, 47; umbo-ventral diam., 38; sectional diam., 21 mm.

Most like *C. tristis*, Lamk., but the anterior side is more developed, more cordate, the post-dorsal margin more arched, and the concentric folds narrower and more numerous.

Chione Kergueleni, *spec. nov.* Pl. ii., fig. 2.

Oval-cordate, subventricose. Post-dorsal margin regularly convex; ventral margin slightly curved, rising rapidly to the anterior margin; interior margin quite entire.

Ornamented with depressed concentric ridges, separated by narrow deep sulci; about eight ridges in a width of ten millimetres at the front (but the various examples show considerable variation in the number of the growth-ridges); faintly radiately and densely striated at least on the sub-surface shell-layer.

Antero - posterior diameter, 57; umbo-ventral diam., 48; sectional diam., 32 mm.

This species differs from *C. Hallii* by its regularly convex dorsal margin and its wide concentric ridges.

Gari ? *sp.*

The collection contains a single example of a member of the family Psammobiidæ, as inferred fram its shape and the presence of a ligamental plate, but as the antero-dorsal area is wanting the generic location cannot be fixed. Left valve very flattened, the ventral margin nearly straight, somewhat pointed posteriorly.

Antero-posterior diameter, 50; dorso-ventral diam., 25 mm.

It does not agree with any described recent species of the family, though it approaches to *Solenotellina siliqua*, Reeve, inhabiting New Zealand.

Mytilus, *sp.* (aff. *M. planulatus*).

Shell elongately oval, solid, somewhat angularly attenuated towards the umbo, which is bent downwards, transversely moderately convex. (Smooth with low concentric growth-folds.) Anterior margin straight, dorsal margin uninterruptly arched, ventral margin.

Length (incomplete), 95 mm.; greatest width medially, 65 mm. (One imperfect valve, much decorticated).

This fossil is distinct from *M. planulatus*, Lamarck, and *M. latus*, Chemnitz, by its uniformly curved dorsal margin; being unable to make a comparative study with *M. chorus*, I avoid applying a distinctive denomination.

Mytilus, *sp.* (aff. *M. Magellanicus*).

A mould of a radially sculptured mussel is suggestive of *M. Magellanicus*, but the fine regular radiating ridges indicate some other reference.

EXPLANATIONS TO PLATES.

Plate II.

Fig.

1. *Chione permagna.* Nat. size.
2. *Chione Kerguelini.* Nat. size.
3. *Turritella Hallii.* *a*, Nat. size; *b*, sectional portion of a whorl, enlarged.
4. *Natica Tremarici.* Sectional three views, slightly enlarged—*a*, from above; *b*, frontal side; *c*, base.
5. *Chione Hallii.* Nat. size.

Plate III.

Cat's Ears, looking south-east from Long Island, near entrance to Royal Sound. (A sketch by Mr. R. Hall, 4-1-98).

1. Cat's Ears.
2. Fossil bed.
3. Heavy masses of rock.
4. Lava much contracted and distorted.

SECTION OF A WELL-BORE AT MULGUNDAWA, NEAR WELLINGTON, SOUTH AUSTRALIA.

By PROFESSOR RALPH TATE.

[Read September 3, 1900.]

In the latter part of 1899 Dr. Stirling, on behalf of Mr. Knight, of Mulgundawa, handed me some siftings of certain fossil-developments obtained from a well-boring (the further sinking of which had to be abandoned), with the view to an opinion as to the probability of reaching water at no inconsiderable depth, if a second venture should be decided on.

Well No. 1 was sunk to a depth of 214 feet. At 213 feet a shell-bed, rich in fossils, was penetrated. The fosssils are mainly identical with those of the chief fossil-bed in the Kent Town bore, and with those from 380 to 424 feet (=312 to 356 above sea-level) at the Ki-Ki bore, in the Ninety-Mile Desert.

The Mulgundawa bore is about ten miles west from Wellington, near the lake-mouth of the Murray River, and one and a half miles from the shore of Lake Alexandrina. Its elevation above sea-level has not been ascertained, but it is not likely to exceed 20 or 30 feet. It is situated about 40 miles N.W. from Ki-Ki, which yielded water at 312 feet below sea-level.* There is great similarity in the beds yielding water in the Ninety-Mile Desert, which agree with those at Mulgundawa—a contemporaneity which is proved by identity of fossil-contents. This led me to express the opinion that water would be found at a depth below 214 feet; and making allowance that the Eocene beds were rising in their westerly extension, I assigned a less depth to reach water than obtained at Ki-Ki.

Bore No. 2 was sunk close to the site of No. 1, and in a letter, dated July 14, 1900, Mr. John S. Knight advises that "At a depth of 292 feet we struck water, which rose to, and is still flowing, from the casing within 3 feet 6 inches of the surface; consider it middling stock water." Thus has been demonstrated the feasibility of an economic application of a detailed knowledge of the actual similitudes of fossiliferous horizons. An increase of like results may lead to the determination of the actual source of water supply contained in the basal beds of the Eocene in the vast area of country extending eastward from the

* See Clark, Trans. Roy Soc., S. Aust, XX., 1896, p. 112.

River Murray into the mallee lands of N.W. Victoria. The quality of the water has not altogether been unsuspected, and it is clear from the position of Mulgundawa that the water is impounded, and in consequence has acquired an accession of mineral ingredients; but it is not improbable that, in course of time, some sensible diminution in the percentage value of its salts will result.

BORE-SECTION AT MULGUNDAWA.

FEET.

30-40. Fine yellow sand, with fragments of oyster; pectens and spines of *Cidaris*.

43. Greyish-yellow fine-grained calciferous sand, with calciferous sandstone pellets. *Isis* sp. and Polyzoa.

60-69. Similar to 43. *Terebratulina catinuliformis*, *Isis* sp., *Scutellina patella*, *Fibularia gregata*, Polyzoa.

75. Same as 43. Shell fragments very rare.

84-93. Same as 60-69. Fossil-debris rare. *Scutellina patella* and other Echinoderms, Graphularia, *Dimya dissimilis*.

97-98. Grey, extremely calciferous sand, and slightly argillaceous. No fossils.

100-107. Same as 60-69. *Terebratulina catinuliformis*.

160-164. Greenish-grey, very fine-grained, calciferous sand. *Terebratulina catinuliformis*.

175. Yellowish-grey, calciferous, sandrock.

180-186. Bluish-grey, clayey sand, very fine, and slightly calcareous. No fossils.

188-200. Grey calciferous sand and sandrock. No fossils.

202-206. Mottled grey-brown sandy clay. Chief source of the fossils.

207-208. Very stiff brown-black clay.

209. Brown clayey sand.

216-226. (From seven levels.) Very stiff brown-black clay.

230-232. Brown clayey sand.

238. Light brown clayey sand.

246-250. Stiff black clay.

254-260. Black and grey clays.

264. Brown clayey sand.

265. Brown sharp sand, with much comminuted shell-debris; the fossils corroded and eroded; small splinters of carbonised wood, freely diffused.

285. Grey calciferous sand, with shell-debris.

292. Greyish-white sand, very fine-grained; the coarser residue of translucent sub-angular quartz grains up to 5 mm. diameter; fossiliferous, and splinters of carbonised wood.

Eocene Fossils from Mulgundawa-bore.*

Lamna, sp.
Otodus, sp.
Otolithes
Fusus, n.sp., aff. sculptilis
Lampusia oligostira
Marginella sub-Wentworthi'
Uromitra, n.sp., aff. subcrenularis
Asthenotoma, n.sp.
Natica Aldingæ
Natica polita
Turritella Aldingæ
Mesalia stylacris
Newtoniella, n.sp.
Solariella, n.sp.
Minolia, n.sp.
Calliostoma, sp.
Bullinella, n.sp., aff. aratula
Scaphander tenuis (?)
Dentalium Mantelli
Dentalium subfissura
Anomia (?) sp.
Dimya dissimilis
Pecten Foulcheri (?)
Amussium Zittelli
Crenella globularis
Septifer, n.sp., aff. fenestratus
Nucula Tenisoni
Leda apiculata
Leda Huttoni
Leda leptorhyncha
Axinæa Cainozoica
Limopsis insolita, var.
Limopsis, n.sp.
Barbatia celloporacea
Barbatia limatella
Barbatia, sp.
Trigonia semi-undulata
Crassatella communis, var.
Cardita, n.sp.
Carditella, n.sp., aff. polita
Verticordia, n.sp., aff. rhomboidea
Lucina despectans
Chione Cainozoica
Meretrix tenuis
Dosinia imparistriata
Tellina porrecta
Tellina, n.sp.
Mactra, n.sp., aff. Hamiltonensis
Myadora lamellata
Myadora, n.sp., aff. prælonga
Corbula pyxidata
Terebratulina catinuliformis
Magasella lunata
Selenaria
Lunulites and many other Polyzoa
Ditrupa
Serpula
Cidaris, sp. (spines)
Echinus Woodsii (?)
Monostychia australis (?)
Scutellina patella
Fibularia gregata
Astrogonium sp.
Pentacrinus
Comatula sp.
Graphularia senescens (?)
Isis, sp.
Flabellum pistinctum
Flabellum dedicellare
Placotrochus deltoideus
Notocyathus viola
Notocyathus excisus
Notocyathus punctatus
Notocyathus, n.sp.
Deltocyathus italicus
Deltocyathus, sp.

* The fragmentary condition of the fossils does not permit in many instances of a satisfactory specific assignment. The corals were determined by Mr. J. Dennant.

Description of a New Species of Acanthiza (*A. tenuirostris*).

By A. Zietz, F.L.S., C.M.Z.S., Assistant-Director of the S.A. Museum.

[Read November 6, 1900.]

This new species is nearest allied to *Acanthiza reguloides*. Its more diminutive size, its feeble bill, the different shade of the rump feathers, and the absence of the bright rufous colouring of the basal third of the tail feathers, distinguish it from *Acanthiza reguloides*, which, according to Gould, is a fairly common species about Adelaide.

Two specimens have been collected by R. M. Hawker, Esq., at Leigh Creek, in August, 1895.

I propose for this new species the name *Acanthiza tenuirostris* (the small-billed Tit).

With the general characters of *A.* (*Geobasileus*) *reguloides*. Upper surface of a more greyish tinge instead of olive brown. The feathers on the forehead are much darker and broadly margined with white. Upper tail coverts of a yellowish white tinge; in *A. reguloides* they are ochreous. Under surface whitish and slightly tinged with yellow. Throat and chest still paler, each feather with a very slight broken margin of brown. Base of tail only with a faint, just perceptible, rufous tinge. The external margin of the centre tail feathers, and the tips of all greyish. Upper tail coverts whitish, slightly shaded with fawn.

For comparison I give the measurements of *A. reguloides* from the hills east of Adelaide, together with those of the new bird.

	A. tenuirostris.	*A. reguloides.*
Total length ...	3·5 inches ...	4 inches
Length of wing ...	1·9 " ...	2 "
Length of culmen...	·3 " ...	·4 "
Height of bill ...	·1 " ...	·12 "

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

XXVII.

[Read October 2, 1900.]

LAMELLICORNES.

HETERONYX.

H. grandis, sp. nov. Robustus, elongato-ovatus; postice manifeste dilatatus; minus nitidus; piceo-ferrugineus, antennis pedibusque paullo dilutioribus; pilis cinereis subtilibus sat elongatis sat crebre vestitus; capite (clypeo incluso) sat grosse ruguloso; prothorace aspere subtiliter confertim, elytris sat crebre minus subtiliter, pygidio fere ut elytra sed magis leviter, punctulatis; clypeo antice late leviter rotundato, sutura clypeali bene determinata, angulata; pronoto quam longiori ut 5 ad 3 latiori, lateribus leviter arcuatis, basi modice bisinuata, angulis anticis acutis sat productis posticis obtusis; elytris obsoletissime interrupte substriatis; tibiis anticis extus obtuse tridentatis; labro longe sub clypeum sito; antennis 9-articulatis; coxis posticis ad latera quam metasternum parum brevioribus, quam segmentum ventrale 2um multo longioribus; tarsis posticis minus elongatis, articulo 2° quam 1us manifeste longiori; unguiculis appendiculatis, parte apicali quam basalis parum breviori. Long., 8 l.; lat., 4 l.

This remarkably fine *Heteronyx* is near *piceus*, Blanch. In my tabulation of the species of that group (P.L.S., N.S.W., 1892, pp. 488-9) it must be placed next after *alpicola*, Blackb., as follows:—

HHHH. Sculpture of pronotum very much finer and closer than of head and elytra ... ... *grandis*, Blackb.

The elytra of this species are not truly striate, but their surface is slightly (scarcely visibly) uneven owing to the presence of faint longitudinal wide elevations, the margins of which, from a certain point of view, give the elytra a scarcely noticeable quasi-striate appearance.

Victoria; Dividing Range (unique in my collection).

ELATERIDÆ.

CHROSIS.

C. angusticollis, sp. nov. (Mas). Angusta; valde elongata; ferruginea, prothorace coccineo (in medio nigricanti), capite antennisque nigris, pedibus piceis; capite sparsim fortiter punctulato, pilis albidis sat elongatis sparsim vestito; prothorace quam ad basin latiori vix (quam ad medium latiori ut 10 ad 7) longiori, supra longitudinaliter profunde trisulcato, ut caput pubescenti, sparsim subtiliter (ad latera magis crebre magis grosse) punctulato, antice fere truncato, lateribus sat parallelis, angulis posticis fortiter divaricatis; elytris breviter (apicem versus magis longe) pubescentibus, ad apicem oblique subtruncatis, sat fortiter striatis, interstitiis leviter convexis punctulatis. Long., 8 l.; lat., 2 l. (vix).

Allied to *C. trisulcatus*, Er., but extremely distinct by, *inter alia multa*, the very much sparser puncturation of its head and prothorax and the narrower and more parallel form, and the more abruptly divaricate hind angles of the latter. The antennæ considerably passing the base of the prothorax indicate the specimen before me to be a male.

Victoria (Dividing Range).

PARASAPHES.

P. quinquesulcatus, sp. nov. Angustus; valde elongatus; ferrugineus, capite antennis et prothoracis vittis 2 nigricantibus, femoribus infuscatis; capite crebre subfortiter punctulato, pilis albidis sat elongatis vestito; prothorace quam ad basin latiori ut 10 ad 8 (quam ad medium latiori ut 10 ad 7) longiori, supra longitudinaliter sat profunde 5-sulcato, in partibus medianis elevatis glabro sparsim subfortiter punctulato, alibi ut caput pubescenti confertim subtiliter (latera versus magis grosse) punctulato, antice subtruncato, lateribus fere rectis, angulis posticis haud divaricatis; elytris breviter pubescentibus, ad apicem valde acuminatis, sat fortiter striatis, interstitiis leviter convexis punctulatis. Long., 7 l.; lat., 1½ l.

There seems to be no doubt that this species and the following should be associated generically with that for which Dr. Candèze proposed the name *Parasaphes*. They bear a remarkable general resemblance to *Chrosis*, but differ from it in respect of important structural characters,—notably their very much shorter head and the widely different form of their mesosternum and tarsi. The former is (not horizontal but) strongly declivous; and the latter have their basal joint very elongate, the 2nd scarcely half as long as the basal one and slightly dilated; the 3rd still shorter,

more strongly dilated and sublamellate; the 4th extremely small (little more than a nodule); the 5th about the same length as the preceding 3 together. I have before me specimens of an insect that seems certainly to be Candèze's typical species of the genus (*P. elegans*), but it is from Tasmania (my own capture) not Queensland (Candèze's locality.) There are thus known to me three species of the genus, *P. elegans* being distinguishable from the other two by, *inter alia*, the much less acuminate apices of its elytra, and *P. quinquesulcatus* from the other two by, *inter alia*, the non-divaricate hind angles of its prothorax. In all three the carina within the hind angle of the pronotum is very strongly defined and continued more or less distinctly to, or even beyond, the middle of the pronotum. My specimen of *P. quinquesulcatus* is probably a female, as the antennæ scarcely pass the base of the prothorax.

Victoria (Dividing Range).

P. bicolor, sp. nov. Angustus; valde elongatus; niger, pronoti sulco mediano lateribusque et prosterni lateribus rufis; capite crebre subfortiter punctulato, pilis albidis sat elongatis vestito; prothorace quam ad basin latiori ut 7 ad 6 (quam ad medium latiori ut 7 ad 5) longiori, supra longitudinaliter sat profunde 5-sulcato, in partibus medianis elevatis glabro sparsim subfortiter punctulato, alibi ut caput pubescenti, confertim subtiliter (latera versus magis grosse) punctulato, antice subtruncato, lateribus leviter arcuatis, angulis posticis divaricatis; elytris breviter pubescentibus, ad apicem valde acuminatis, sat fortiter striatis, interstitiis punctulatis leviter convexis.

Maris antennis prothoracis basin longe, feminæ parum, superantibus. Long., $5\frac{3}{4}$—$6\frac{1}{2}$ l.; lat., $1\frac{1}{5}$—$1\frac{1}{2}$ l.

Victoria (Dividing Range).

MALACODERMIDÆ.

SELENURUS.

S. fernshawensis, sp. nov. Elongatus; capite nigro, antice flavo-notato, mandibulis plus minusve luteis, antennis palpisque nigro-piceis; prothorace luteo, macula magna discoidali nigra ornato, hac antice margines laterales attingenti, postice bifida; elytris viridibus ante apicem macula suturali flava ornatis; corpore subtus nigro, flavo-maculato; pedibus piceis; capite prothorace lævibus; hoc subquadrato postice paullo angustato, margine antico late rotundato, angulis subrotundatis; elytris crebre rugulose punctulatis, quam abdomen multo brevioribus, ad apicem dehiscentibus. Long., 4—5 l.; lat., $\frac{4}{5}$—1 l.

Congeneric with a species I described in Tr.R.S., S.A., 1892, pp. 220-221, but referred to *Selenurus* subject to the doubt I have already expressed *(loc. cit)*.

Victoria (Fernshaw).

TELEPHORUS.

T. pulchellus, Macl. var. (?) *notophilus*. I have before me two specimens belonging to the S.A. Museum, which appear to be a remarkable variety of *T. pulchellus*. They differ from the type in having a wide very conspicuous and sharply limited yellow fascia on the elytra a little behind the middle. I can, however, find no other difference. I have seen hundreds of specimens of *T. pulchellus*, but never one (except these) in which the elytra were not unicolorous. The specimens before me are from Carrieton (South Australia) and are male and female.

CLERIDÆ.

The Australian *Cleridæ* are much in need of revision, such descriptions as have been published being scattered through a great variety of (chiefly non-Australian) works, and many of them still standing as referred to genera with which they have nothing to do. The following notes are a contribution to the task of reducing them to order.

I am not aware of the existence of any memoir showing the relation to each other of the various genera among which the Australian *Cleridæ* are distributed, except Lacordaire's "Genera des Coléoptères," where such of the Australian genera as were known forty-three years ago find a place among the *Clerid* genera of the world, and some memoirs by the Rev. H. S. Gorham dealing with such as were known of them in certain groups of the *Cleridæ* twenty-four years ago, where again they are placed among the *Cleridæ* of the world belonging to those groups. I have, therefore, considered it desirable to provide a tabulated statement of the characters distinguishing the genera to which the known Australian *Cleridæ* can be referred for the use of students in Australia.

Herr Lohde has recently published a catalogue of the *Cleridæ* of the world, which is of the highest possible value, and includes nearly all the corrections that have been made in the generic position of the Australian species, but as a large part of the erroneous generic determinations of the earlier describers have never been corrected in any published treatise those determinations are still, of course, uncorrected in this recent catalogue. As far as possible I have corrected these in the following pages.

I begin with a tabulation of the characters of the *Clerid* genera known to occur in Australia, and then furnish more particular notes concerning some of those genera, together with the diag-

nosis of two new genera, descriptions of some new species, and a revision of one genus (Aulicus).

Tabulation of Australian *Clerid* genera :—

A. Eyes more or less emarginate.
  B. All the tarsi (viewed from above) distinctly 5-jointed.
    C. Head elongate, parallel ... ... Cylidrus.
    CC. Head oval ... ... Tillus.
  BB. Genera not having all the tarsi (viewed from above) distinctly 5-jointed.
    C. The front tarsi (viewed from above) distinctly 5-jointed.
      D. Eyes strongly emarginate.
        E. Space between the eyes considerably wider than diameter of part of eye visible from in front.
          F. Club of antennæ lax and long ... Clerus.
          FF. Club of antennæ abrupt and comparatively short ... ... Eleale.
        EE. Space between eyes equal to diameter of part of eye visible from in front ... Stigmatium.
        EEE. Space between eyes much narrower than diameter of part of eye visible from in front ... ... Omadius.
      DD. Eyes scarcely emarginate ... ... Orthrius
    CC. The front tarsi viewed from above appear to have only 4 joints.
      D. The appearance (from above) of the tarsi having only 4 joints arises from the basal joint being concealed under the second.
        E. The eyes very coarsely granulate.
          F. The apical joint of the maxillary palpi securiform ... ... Opilo.
          FF. The apical joint of the maxillary palpi elongate subtriangular.
            G. Body winged ... ... Natalis.
            GG. Body apterous ... ... Cormodes.
        EE. The eyes much more finely granulate.
          F. The apical joint of the maxillary palpi not securiform.
            G. Club of antennæ gradual and very feeble ... ... Metabasis.
            GG. Club of antennæ abrupt and strong Cleromorpha.
          FF. The apical joint of the maxillary palpi more or less strongly securiform.
            G. Mesosternum vertical in front ... Zenithicola.
            GG. Mesosternum not vertical in front.
              H. Elytra with conspicuous basal fascicles ... ... Trogodendron.
              HH. Elytra with large basal tubercles Olesterus.
              HHH. Elytra at base even (or nearly so).
                I. Pronotum with a conspicuous ante median transverse sulcus.
                J. Elytra not more than twice as long as (at their base) wide Aulicus.
                JJ. Elytra much more than twice as long as (at their base) wide.

K. The whole surface of the elytra coarsely rugulose; head elongate ... ... Scrobiger.
KK. Apical one-third or more of elytra smooth; head short ... ... Neoscrobiger.
II. Pronotum not having an antemedian sulcus.
J. Hind tarsi much longer and narrower than front tarsi ... Tarsostenus.
JJ. All the tarsi very similar *inter se* ... ... Tarsostenodes.
DD. The appearance (from above) of the tarsi having only 4 joints arises from the 4th joint being a mere nodule.
E. Antennal club composed of 8 serrate joints ... ... Tenerus.
EE. Antennal club composed of not more than 4 joints.
F. Apical joint of maxillary palpi strongly securiform ... ... Thanasimomorpha.
FF. Apical joint of maxillary palpi not (or scarcely) securiform.
G. Eyes very strongly granulate ... Pylus.
GG. Eyes much less strongly granulate.
H. Antennal club abrupt and strong.
I. Pronotum much expanded laterally but scarcely margined ... Parapylus.
II. Pronotum conspicuously margined laterally.
J. Apical joint of maxillary palpi elongate-triangular ... Corynetes.
JJ. Apical joint of maxillary palpi oval ... ... Necrobia.
HH. Antennal club elongate narrow and feebly defined .. .. Crobenia.
CCC. The front tarsi (viewed from above) appear to have only 3 joints ... ... Paratillus.
AA. Eyes entire.
B. Elytra wider at their base than the base of the prothorax ... ... Lemidia.
BB. Elytra not wider at their base than the base of the prothorax ... ... Allelidia.

TILLUS.

The only Australian species that stand in this genus in Catalogues (Lohde's included) are *hilaris*, Westw., and *dux*, Westw. The former of these is stated by Gorham (Cist. Ent., II., p. 62) to be congeneric with *Tillus bipartitus*, Blanch., and greatly to resemble it, but not to be a *Tillus*. *T. bipartitus* is the type of my genus *Thanasimomorpha* (my identification of *T. bipartitus* was confirmed by Dr. Sharp). I have before me a small *Clerid* from Victoria which agrees well with Westwood's description of *T. hilaris* (a Tasmanian species) in every respect except in being a trifle small and having its tibiæ and tarsi infuscate. It differs

from *T. bipartitus* considerably in the sculpture of its pronotum but otherwise its structural characters seem identical,—granulation and shape of eyes, length and structure of antennæ, structure of palpi, &c. Like *T. bipartitus* it seems to have only four tarsal joints even under a strong power, and it is not easy to feel quite certain which is the missing fifth joint, but I am fairly confident that it is the penultimate which is abnormal, and exists only as a minute nodule at the base of the apical joint. I have no doubt that the specimen before me either is *T. hilaris* or is excessively close to it, and that *T. hilaris* is a *Thanasimomorpha*, but whatever it is, it is not a *Tillus*.

T. dux, Westw., is a complete enigma. I incline to the opinion that its author was mistaken in calling its claws appendiculate, in which case it might well be a large *Natalis*, but if he was not mistaken I can make no suggestion about it except in saying that the description, and especially the size, do not suggest a true *Tillus*. I am therefore of opinion that there is no true *Tillus* known in Australia. It certainly seems unlikely that among all the Australian *Cleridæ* before Mr. Westwood there was not a *Natalis* but that there was a specimen, of the remarkably large size of a *Natalis*, subsequently (so far as I can discover) not mentioned by any author, and appertaining to a different genus.

OPILO.

To this genus nine Australian species are attributed in Masters' Catalogue; in Lohde's Cat. they stand at the same number but are not the same insects, *O.* (*Notoxus*) *ephippium*, Boisd., and *mærens*, Westw., having been removed, the former (vide Tr. Roy. Soc., 1891, p. 303) having been shown to be a *Trogodendron* and the latter having been referred (I think wrongly,—vide infra) by Chevrolat to *Scrobiger*. Their places are filled by *O. variipes*, Chevr. (apparently omitted accidentally by Masters) and *O. floccosus*, Schenk., on which a note will be found below. A change of name also occurs, *Whitei*, Gorh., being substituted for *apicalis*, White (nom. præocc.), a synonym that appears to have escaped Mr. Masters' notice.

Concerning the species referred to *Opilo* in Lohde's Catalogue I offer the following notes:—

O. congruus, Newm. A true *Opilo*; very variable and common all over Australia.

O. eburneocinctus, Gorh. Not known to me. Probably a true *Opilo*.

O. ephippiger, White. Identical with *Trogodendron* (*Notoxus*) *ephippium*, Boisd., as pointed out by me (Tr. Roy. Soc., S.A., 1891, p. 303). Herr Lohde does not appear to have observed my note.

O. floccosus, Schenkl. I have in my collection a *Olerid* which agrees with Herr Schenkling's description of this species in every respect except that it has the palpi of a *Natalis* and should be referred to that genus. As Schenkling states that *floccosus* has the palpi of an *Opilo* I am compelled to suppose that the insect before me is not his species in spite of its agreement in other respects with his excellent description. I shall not however venture on describing it on the ground that he may possibly have incorrectly observed the palpi he described. It bears some resemblance to but is quite distinct from *Natalis*, *Leai*, Blackb.

O. incertus, Macl. Not known to me. Probably a true *Opilo*.

O. Pascoei, Gorh. A true *Opilo*. I have it from Victoria.

O. sexnotatus, Westw. Not a true *Opilo* as it has finely granulated eyes. I give it a new generic name (*vide infra*).

O. variipes, Chevr. A true *Opilo*, apparently very close to *O. congruus*, Newm.

O. Whitei, Gorh. (*apicalis*, White). Unknown to me. I doubt its being a true *Opilo*.

Thus it appears that there are five known Australian species confidently referable to *Opilo* and two doubtfully attributable to it.

NATALIS.

N. debilis, sp. nov. Mas.? Elongata; angusta; sat parallela; subtus sat sparsim pubescens; supra pilis erectis elongatis sparsis vestita; nigra, pedibus antennis et corpore subtus picescentibus; antennis sat elongatis sat gracilibus; oculis minus prominulis; capite confertim subtilius subaspere punctulato, puncturis paullo majoribus sparsim intermixtis; prothorace quam latiori ut 7 ad 5½ longiori, ut caput punctulato et ad latera nonnihil (fere ut *N. porcatæ*, Fab.) ruguloso, sulco longitudinali mediano lineari sat elongato impresso, pone medium utrinque fortiter dilatato-rotundato; scutello confertim subtiliter punctulato; elytris ad apicem inermibus, seriatim punctulatis, puncturis quadratis (antice profundis sat magnis, postice gradatim minoribus minus profunde impressis); interstitiis alternis leviter costiformibus; tibiis anterioribus 4 arcuatis; abdomine sparsim subtiliter punctulato, segmentis postice late membranaceo-marginatis; pedibus sat gracilibus, femoribus posticis perlongis; tarsis sat elongatis sat gracilibus. Long., 6½ l.; lat., 1⅔ l. (vix).

At once distinguishable from all the previously described *Natales* except *porcata*, Fab., by the close even puncturation of the entire disc of its pronotum and the feebleness of the lateral rugulosity of that segment. From *porcata* it differs *inter alia* by its black colour, by its distinctly less convex eyes, by its very much more elongate prothorax, by the very evidently closer and

finer puncturation of its pronotum, and by the very wide membranous hindmargin of each ventral segment,—which is certainly not due to the abdomen of the specimen before me being distorted or unduly dilated. I have little doubt of the specimen described being a male, in which case the species is distinguished from many of its congeners (but not from *porcata*, Fab.) by the absence of patches of close sexual puncturation on the ventral segments. In my tabulation of *Natalis* (Tr. R.S., S.A., 1899, pp. 29-30) the inclusion of this species would cause the substitution for the last line of the following:—

AA. Disc of prothorax closely and evenly punctulate.
  B. Prothorax much longer than wide ... ... *debilis*, Blackb.
  BB. Prothorax very little longer than wide .. ... *porcata*, Fab.

S.A. (basin of Lake Eyre); taken by Herr Koch near Farina.

THANASIMUS.

There seems to be reason for regarding all the Australian insects that have been referred to this genus as incorrectly placed there. *T. accinctus*, Newm., has already been made the typical species of a new genus (*Metabasis*, Gorh.), and Mr. Gorham has already referred (correctly, I have no doubt) *T. sculptus*, Macl., and his own *T. rufimanus* to the genus *Aulicus*. *Necrobia eximia*, White (which has been attributed to *Thanasimus* by some authors,—*e.g.*, Gorham) is certainly not a *Thanasimus* in my opinion,—but here I am writing from memory (having examined a specimen not at this moment available) and so will not at present discuss its position more particularly. I know of only three other Australian species that have been placed in *Thanasimus* (viz., *acerbus*, Newm., *confusus*, Newm., and *cursorius*, Westw.), and they undoubtedly belong to the genus *Stigmatium*. They are all described insufficiently for confident identification among congeners so numerous and superficially so closely resembling each other as are the species of *Stigmatium*, but it seems to me probable that *acerbus* and *cursorius* are founded on the same insect and that it is also the same which M. Kuwert has since described as *S. dispar*. I think I know *S. confusus*, Newm., as a species that I have met with in Victoria (Newman's locality) not rarely, and it is probably identical with one or more of the species that have since been described as *Stigmatia* by other authors, but without examination of types it is difficult to arrive at a confident opinion.

CLERUS.

I regard it as extremely doubtful whether any true *Clerus* occurs in Australia. Eight Australian species are ascribed to the genus in Masters' Catalogue, one of which (*crassus*, Newm.) disappears in Lohde's Cat., having been reported (Tr. R. Soc., S.A.,

1891, p. 303) as a *Zenithicola*. Of the remainder *C. apicalis*, Macl., *Mastersi*, Macl., and *delicatulus*, Bohem., are *Aulici* (as noted below); *C. cruciatus*, Macl., is probably a *Lemidia*,—certainly not a *Clerus*; *ventralis*, Westw., is evidently an *Olesterus*; *C. guttulus*, White, has been stated by Gorham to be congeneric with *Tillus bipartitus* and therefore mentioned by me (*loc. cit.*, p. 304) as probably a *Thanasimomorpha* (but I have since identified it, and now place it,—as noted below,—in my new genus *Tarsostenodes*). *C. sepulcralis*, Westw., remains; I have not to my knowledge seen it, nor do I find anything in its description on which I can form a decided opinion as to its generic position. I note however that in a recent memoir Herr Schenkling mentions it as "*Clerus*" *sepulcralis* from which it seems probable that it is at any rate near *Clerus*. Perhaps it is an *Orthrius* (an Australian ally of *Clerus* named by Mr. Gorham and distinguished *inter alia* by its scarcely emarginate eyes).

CLEROMORPHA.

In his diagnosis of this genus (Cist. Ent., II., p. 83) Mr. Gorham indicates the number of tarsal joints visible on their upper surface as doubtful,—owing I presume to the type having lost its tarsi. His conjecture that the number is four is correct.

AULICUS.

Under this name Spinola (its author) included species from America and Australia. Later, Gorham expressed the opinion that the species of the two continents ought to be separated, but says that not having examined any of the American species he "has not ventured on the alteration," and at the same time proposes the name *Phlogistus* for the Australian species, though admitting it doubtful whether Spinola did not consider an Australian species the typical one. This is decidedly puzzling, and does not seem to me to furnish sufficient reason for rejecting Spinola's name in respect of the Australian species, although I observe that in his recent "Cleridarum Catalogus," Herr Lohde has done so but (as was of course to be expected in a mere Catalogue) without assigning a reason. It is quite possible that the need of the change of name may eventually be demonstrated, but in the absence of a diagnosis of *Phlogistus*,—which has not been provided by any author,—I retain the name *Aulicus* for the present.

The Australian species of this genus are in great confusion, not a few of them having been attributed by their authors to the old genera *Thanasimus* and *Clerus* and still standing there even in Herr Lohde's recent Catalogue. Having recently had occasion to examine a considerable number of specimens of *Aulicus* I have

taken the opportunity to study the widely scattered literature of the subject and offer the following notes as an attempt at a systematic treatment of the Australian species. Under the generic name *Aulicus* 21 specific names have been proposed for them, and two species described as *Thanasimi* and one described as *Clerus* have been shown to be in reality *Aulici*,—viz., *T. rufimanus*, Gohr., and *sculptus*, Macl., and *C. instabilis*, Newm. I now draw attention to the fact that the following also appear to be decidedly members of the same genus,—viz., *Clerus Mastersi*, Macl., *apicalis*, Macl., and *delicatulus*, Bohem. Beside the above *Xylotretus scrobilata*, Spin., is stated by Gorham to be "probably an *Aulicus*,"—a reference that is followed (but with a ?) by Herr Lohde. In this I cannot concur. Spinola describes the insect as having "5 or 6" rows of large deep foveæ on the elytra. But in all the large number of *Aulici* I have examined I have never seen one in which there is any doubt at all about the number of rows on each elytron being *ten*,—so emphatically is this the case that I am quite satisfied of the presence of that number of rows of quadrate foveolæ being a reliable generic character (as far as Australian species are concerned). Moreover Spinola describes *X. scrobilatus* as having a "transverse fold" on the non-foveolate apical portion of the elytra,—a character to which there is no approximation whatever in any *Aulicus* (or indeed in any Australian *Clerid*) known to me. I incline to the opinion that *X. scrobilatus* is erroneously attributed to Australia. If not, it probably represents a genus as yet uncharacterised. But if the "transverse fold" can be disregarded as (say) a deformity of the individual specimen, it is possible that the insect in question is a *Zenithicola*, as in species of that genus (*e.g.*, *australis*, Boisd.) the foveolæ of the lateral are so much smaller than those of the discal series that it would be correct to say there are "about 5 or 6 rows of *large deep* foveæ," though even in that case one would wonder that the describer had not added that there are also other rows of much smaller foveæ. The generic identification of *X. scrobilatus* is impossible without an inspection of the type, but whatever it may be it is not an *Aulicus* unless the description is outrageously incorrect. Unfortunately Spinola gives a wrong reference to his figure, which imparts a further difficulty into the matter (as Gorham points out, Cist. Ent., II., 88), but the figure that is probably intended for *X. scrobilatus* looks as if it might represent a *Zenithicola*.

Altogether, then, there are 27 names that must be regarded as having been given to Australian species of *Aulicus*, but a considerable number of these are synonyms, some of which have already been shown to be so. It will be convenient, however, to recapitulate them all now. The following, however, I believe to be founded on error, or mere conjecture :—

A. episcopalis, Spin., wrongly regarded by Spinola as a synonym of *instabilis*, Newn. (discussed below).

A. corallipes, Chevr., quoted by Herr Lohde as a synonym of *foveicollis*, Macl. This seems to me highly improbable. No reason is given for the reference. *A. foveicollis* is practically undescribed. It is a Queensland species, and the type is at Sydney.

A. corallipes is a familiar Tasmanian species.

A. castanipes, Westw., and *A. tibialis*, Westw. (described by White, *Cleria*, IV. 60) placed in all catalogues known to me as synonyms of *A. instabilis*, Newm. I consider this almost certainly wrong. It is possible the names were given to varieties of *A. episcopalis*, Spin., but the matter could not be cleared up without examination of the types (which are no doubt in the Br. Museum).

The following synonymy seems to be correct :—

A. affinis, Gorh.=*A. samaragdinus*, Gorh. Its author says of *affinis* "possibly only a var."

A. varicolor, Chevr.=*A. multicolor*, Chevr. Its author says of *varicolor* "probably only a var."

A. albofasciatus, Gorh.=*A. ochrurus*, Chevr. Mr. Gorham has already noted this synonymy. Both descriptions were published in 1876, and it seems doubtful which has the priority.

A. (*Thanasmus*) *rufimanus*, Gorh.=*A. chrysurus*, Chevr. Already noted by Mr. Gorham.

A. splendidus, Chevr.=*A. sculptus*, Macl. Already noted by Mr. Gorham.

The following synonymy has not been noted previously :—

A. ochrurus, Chevr. (=*albofasciatus*, Gorh.)=*A.* (*Clerus*) *apicalis*, Macl. (Macleay's name has priority).

A. viridissimus, Pasc. is (as more fully indicated below) probably a synonym for *A.* (*Clerus*) *delicatulus*, Bohem.

It should be added that in Herr Lohde's Catalogue the name "auratus, Gory., i.l." occurs as a synonym of *A. instabilis*, Newm. I do not know this insect, and have not seen the description of it, so can express no opinion about it.

Assuming the correctness of the above synonymic notes, 9 of the 27 names referred to above must be regarded as mere synonyms.

Of the 18 names remaining I have been able to identify 14 with insects on which they appear to have been founded. The four that I have not been able to identify are :—

A. foveicollis, Macl. Practically undescribed.

A. imperialis, Gorh. Seems to be differently colored from any *Aulicus* known to me. The structural characters mentioned would fit many *Aulici*.

A. lemoides, Pasc. I have not seen any *Aulicus* that will fit the description. The few structural characters mentioned are founded on a comparison with "*A. instabilis*, Newm.," but it is impossible to ascertain (without reference to his collection) to what *Aulicus* Pasc. attributed that name. I should conjecture *A. lemoides* to be possibly a var. of *A. rufipes*, Macl.

A. mellinipes, Chevr. I am convinced that I have not seen this species. If the statement that its prothorax is longer than wide is strictly accurate (by measurement) I am doubly sure that I have not seen it.

In the following pages I describe nine new species of *Aulicus* and furnish notes on several of the previously described species. I also furnish a tabulation of all the species except the four remarked on above. In this tabulation I have found it necessary in several instances to rely upon colour distinctions, because in the case of species that I have identified only by means of the descriptions it might be misleading to characterise them by characters not actually mentioned in the descriptions, as there is of course a possibility of some of the identifications being wrong, —but, as it is, the tabulation is right according to the authors' descriptions even if my identifications are wrong,—except in the case of *instabilis*, Newm., *episcopalis*, Spin., *delicatulus*, Bohem, and *corallipes*, Chevr., of which I have not seen authentic specimens, but have assumed the correctness of my identification. I may say, however, that I have not the slightest doubt about all the species included in the tabulation being perfectly valid ones. The genus has been in so complete a state of confusion that it seems worth while to treat it as a whole (which has not been done before) in respect of its Australian members, even if my treatment of it should prove eventually to require a few corrections.

Tabulation of species of the genus *Aulicus*:—

A. Elytra variegated with different colouring or pubescence in transverse zones.
  B. At least one of the zones testaceous.
    C. The apex and a median (or submedian) zone testaceous .. .. *apicalis*, Macl.
    CC. Elytra having only a median testaceous zone *crœsus*, Blackb.
    CCC. Elytra having the base and a median zone testaceous.
      D. Prevailing colour of elytra bronzy-red,—no black ... ... *Mastersi*, Macl.
      DD. Prevailing colour of elytra black ... *dives*, Blackb.
  BB. No testaceous colouring on the elytra.
    C. Apical part of elytra not aureo-villose.
      D. Club of antennæ black ... . *multicolor*, Chevr.
      DD. Club of antennæ testaceous ... ... *sculptus*, Macl.
    CC. Apical part of elytra aureo-villose .. *chrysurus*, Chevr.
AA. Elytra not variegated with different colouring or pubescence in transverse zones.
  B. Antennæ black ... . *lætus*, Chevr.

BB. Antennæ not black.
C. Antennæ reaching back to the base of the prothorax ... . *instabilis*, Newm.
CC. Antennæ shorter.
D. Ninth and tenth elytral series quite distinct from each other and separated by a well-defined interstice to beyond middle of elytra ... ... *episcopalis*, Spin.
DD. Ninth and tenth elytral series not as in *A. episcopalis*.
E. External face of tibiæ traversed by a well-defined entire longitudinal carina.
F. Under surface of head and prothorax of dark colour.
G. Seriate sculpture of elytra continuing (gradually enfeebled) to apex *nigrohirtus*, Blackb.
GG. Seriate sculpture of elytra ceases suddenly considerably before apex.
H. No longitudinal sulcus on pronotum behind the front transverse sulcus ... ... *smaragdinus*, Gorh.
HH. A well-defined longitudinal sulcus on pronotum behind the front transverse sulcus... *robustus*, Blackb.
FF. Under surface of head and prothorax pale yellow ... ... *rufipes*, Macl.
EE. External face of tibiæ not having a continuous longitudinal carina.
F. The transverse sulci of the pronotum connected by a strong longitudinal sulcus.
G. Transverse interstices of elytral foveolæ strongly cariniform and crossing several series ... ... *Plutus*, Chevr.
GG. Transverse interstices of elytral foveolæ fine, scarcely raised, and short ... ... *delicatulus*, Bohem.
FF. Transverse sulci of pronotum not connected by a strong longitudinal sulcus.
G. Front of clypeus not both notably narrower than interval between eyes and also much emarginate.
H. Sculpture of elytra quasi-uniform from base to apex, only becoming gradually finer and closer (but not less rugulose) in approaching the apex ... ... *eremita*, Blackb.
HH. Sculpture of elytra much enfeebled at base, gradually becoming towards apex more or less finer, but still continuing rugulose.
I. Prothorax notably wider across apex than across base. (Legs entirely dark) ... ... *amabilis*, Blackb.
II. Prothorax scarcely wider across apex than across base.

J. Pronotum closely evenly and somewhat strongly punctured. (Femora red) ... *cribratus*, Blackb.

JJ. Pronotum about middle of basal part very finely and very sparsely punctured. (Femora dark) ... ... *modestus*, Blackb.

HHH. Sculpture of elytra much enfeebled at base, and behind suddenly changing to fine non-rugulose (or scarcely rugulose) puncturation considerably before the apex.

I. Femora entirely dark... ... *mundus*, Blackb.

II. Femora testaceous or red ... *corallipes*, Chevr.

GG. Front of clypeus considerably narrower than interval between eyes and also much emarginate *parvulus*, Blackb.

A. Cræsus, sp. nov. Supra cupeo-purpureus, elytris mox ante medium fascia testacea (hac nec suturam nec marginem lateralem plane attingenti) ornatis, corpore subtus cœruleo, labro palpis antennisque testaceis, pedibus obscuris (tibiis anticis subtus et tarsis anticis dilutis; pilis albidis elongatis sat sparsim vestitus; capite crebre fortiter subrugulose punctulato; antennis prothoracem medium vix attingentibus, articulo ultimo ad apicem emarginato; prothorace manifeste transverso, fere ut caput (sed antice minus crebre) punctulato, antice tubulato, ad partis tubulatæ basin transversim fortiter arcuatim sulcato, pone sulcum late concavo, in partis concavæ fundo longitudinaliter sulcato, mox ante basin transversim sulcato, lateribus inter sulcos transversos fortiter rotundatis; elytris 10-seriatim grosse foveolatis, seriebus basin versus vix minus distinctis vix elytrorum partem apicalem tertiam attingentibus, hac puncturis sat grossis confuse minus crebre impressa, seriebus 9ª 10ª que carina distincta ad elytrorum partem apicalem tertiam divisis. Long., $3\frac{3}{5}$ l.; lat., $1\frac{3}{10}$ l. (vix).

This species is readily distinguishable from all previously described Australian *Aulici* by its colour and marking. It will be convenient to compare it and others of its congeners with *A. chrysurus*, Chevr. (*Thanasimus rufimanus*, Gorh.), that being a previously described species which there can be no difficulty in identifying with certainty. Compared with it the present species *inter alia* differs as follows:—Antennæ much shorter (joints 9 and 10 much more transverse, joint 11 much more emarginate at apex), prothorax more transverse with much more strongly rounded sides, foveæ of the elytral series much larger (reaching the base and extending much further towards the apex). Its nearest ally is the species that I regard as *A. episcopalis*, Spin. (=*instabilis*,

Spin. var.) from which it differs (apart from colour and markings) chiefly by its shorter and more convex form, the larger and less crowded foveæ of its elytral series, the less abrupt cessation posteriorly of the same foveæ, and their continuity to the actual base of the elytra. The antennæ of these two species are extremely similar, also the conspicuousness of the ninth and tenth series of foveæ and their interstice to the commencement of the smooth apical part of the elytra.

S. Australia (Yorke Peninsula).

A. dives, sp. nov. Cyaneus, elytrorum parte dimidia basali testacea utrinque macula magna atro-cyanea humerali ornata (parte dimidia apicali atro-cyanea utrinque macula magna sanguinea ante-apicali notata), antennis palpis tibiis anticis tibiarum intermediarum apice et tarsis anticis intermediisque testaceis; pilis albidis elongatis sparsim vestitus; capite fortiter minus crebre punctulato; antennis prothoracem medium haud attingentibus, articulis 9°—11° transversis, 11° ad apicem leviter emarginato; prothorace sat fortiter transverso, fere ut caput (sed nonnihil magis grosse) punctulato, antice breviter tubulato, ad partis tubulatæ basin transversim fortiter arcuatim sulcato, pone sulcum late concavo, in partis concavæ fundo longitudinaliter sulcato, mox ante basin transversim sulcato, lateribus inter sulcos transversos sat fortiter rotundatis; elytris 10-seriatim grosse foveolatis interstitiis minus angustis, seriebus basin versus obsoletis nec elytrorum partem apicalem tertiam attingentibus, hac sparsim sat subtiliter punctulata, seriebus 9ª 10ª que vix ultra elytra media attingentibus. Long., 3 l.; lat., $1\frac{1}{5}$ l. (vix).

In this species the apical joint of the maxillary palpi is more strongly securiform than in most of its congeners. Lacordaire tabulates *Aulicus* as having that joint securiform, but in diagnosing the genus says that it is of the form of an elongate triangle, which is quite correct as regards most of the species,—but in this one the triangle is scarcely elongate. It may be noted, too, that Lacordaire calls the claws of *Aulicus* "simple," but I find them to have a very small and feeble sub-basal tooth which in the present species is scarcely traceable. This species is remarkable for its short antennæ, having their apical joint distinctly transverse. The seriate punctures of the elytra are scarcely smaller than in *A. crœsus* but they are less sharply defined, their interstices being less narrow and carina-like than in most *Aulici*. Apart from coloring and pattern the present species differs from *A. chrysurus, inter alia* by the very much coarser seriate punctures of its elytra, from *A. crœsus* by the seriate puctures of the elytra not nearly reaching the base, from *A. episcopalis* by the

9th and 10th series scarcely passing the middle of the length of the elytra, and from *A. apicalis*, Macl., by the apical part of its elytra nearly black. It is perhaps nearest to *A.* (*Clerus*) *Mastersi*, Macl. The characters attributed to that species (apart from those relating to colour) are valueless for identification, being common to almost all *Aulici*. The pattern of *A. Mastersi* seems to bear a general resemblance to that of the present insect, but the general colour of the elytra is said to be "bronzy red" which is certainly not the general colour in *A. dives*, and the very great distance apart of the localities in which the two insects were taken renders it unlikely that they are varieties of one species.

S. Australia (Mt. Lofty Range).

A. nigro-hirtus, sp. nov. Supra cœruleus purpureo-micans, subtus cyaneus, antennis (clava nonnihil infuscata excepta) palpis et tarsis anticis testaceis, tibiis anticis subtus ferrugineis, pedibus alibi purpureis; pilis sat elongatis (his in corpore supra obscuris, subtus albidis) vestitus; capite crebre fortius nec rugulose punctulato; antennis prothoracem medium vix superantibus, articulo ultimo fere ut generis *Eleale* appendiculato; prothorace vix transverso, fere ut caput punctulato sed puncturis rugis transversis intermixtis, postice breviter (sed antice nullo modo) tubulato, antice transversim arcuatim (postice recte) sulcato, inter sulcos æqualiter convexo, lateribus ab angulis anticis fere ad basin æqualiter arcuatis; elytris 10-seriatim foveolatis, seriebus 9ª 10ª que ultra medium vix distinctis ceteris in elytrorum partem quartam apicalem continuis, foveolis quam *A. chrysuri*, Chevr., parum magis grossis, parte apicali confuse nec crebre punctulata; tibiis extus carinatis. Long., 4 l. (vix); lat., $1\frac{2}{5}$ l.

The notable characters of this species are the strongly appendiculate apical joint of its antennæ which is scooped out on its wide compressed face in such fashion as to make it from a certain point of view look like two joints, the pronotum without concavity or longitudinal sulcus behind the anterior transverse sulcus, and the tibiæ with a conspicuous longitudinal carina on their external face. The foveæ of the elytral series are notably less coarse and more closely placed than in the species I call *episcopalis*, Spinola; the series (as such) are exceptionally conspicuous owing to the longitudinal interstices being distinctly more elevated than the interstices separating fovea from fovea in the series. Perhaps nearest to *A. imperialis*, Gorh., but evidently very distinct from it as that species is described as having its pronotum abruptly narrowed in front and much depressed dorsally.

N. Queensland.

A. instabilis, Newm. There seems to be much confusion about

this species. It is quite clear to me that Spinola did not identify it correctly, and I should say that in all probability Newman himself mixed two species under the name. Newman's very brief description mentions only one character that is of real value in determining what insect he had before him, viz., "protibiæ subtus testaceæ." Trivial as this character might seem I have examined sufficiently long series of several *Aulici* to enable me to say that it is of great value. To this clue may be added another in the fact that almost all the *Cleridæ* described by Newman are Victorian species, and still another in the *size* (long., $\frac{4}{10}$ of an inch) being stated. Now I have taken somewhat plentifully in Victoria two species of *Aulicus* whose front tibiæ are invariably black (or dark piceous) on their upper surface and testaceous beneath, the two colours being in quite abrupt and conspicuous contrast. My opinion is that Newman had both these insects before him and did not observe their specific difference. One of them is about of the size Newman quotes, and of deep violet blue colour with elongate antennæ,—the other is decidedly smaller and of a bright green colour with shorter antennæ. Newman says "Colore instabilis, nunc viridis, nunc violaceus" and mentions no other character that is not generic except the peculiar colouring of the front legs. As the size given is that of the larger insect just referred to I feel little doubt of its having been that on which the species *instabilis* was founded and conjecture that either Newman had before him also a green variety (unknown to me) of it, or that he had before him the smaller species referred to above and overlooked its specific difference from the specimen on which he founded his description (or at all events his measurement).

I feel very little doubt that *A. instabilis*, Spinola, is a species that occurs in many parts of S. Australia and even extends into the S.-Eastern part of Western Australia, and is much more variable in colouring than I have found the species to be which I regard as *instabilis*, Newm. Its front tibia are not of two colours divided longitudinally, but are (as Spinola describes them) wholly dark except near the apex where they have a tendency to become testaceous. The species differs from that mentioned above as *instabilis*, Newm., *inter alia* by its shorter antennæ, and the considerably larger seriate punctures of its elytra which moreover are well defined on a larger area of the elytra (becoming obsolete only close to the base and in the apical one-fourth), the ninth and tenth rows being separated by a continuous distinct carina quite into the apical one-fourth of the elytra. As Spinola described a colour-var. of this insect under the name *episcopalis*, this latter may now stand as the name of the species.

A. robustus, sp. nov. Sat elongatus, sat convexus; supra ignis cupreus, capite pronotoque paullo obscurioribus, antennis palpisque testaceis (illarum clava et palporum labialium articulo apicali obscuris); subtus obscurus vel atro-cyaneus, pedibus læte cyaneis, tarsis anticis ferrugineis ceteris picescentibus; pilis pallidis elongatis vestitus; capite fortius sat crebre punctulato, inter oculos late leviter impresso; antennis prothoracem medium paullo superantibus, articulis 9° 10° que sat transversis 11° obovato ad apicem acuto extus leviter excavato; prothorace vix transverso, supra sparsim fortius inæqualiter nec rugulose punctulato, sat longe pone apicem arcuatim (et mox ante basin recte) sulcato, pone sulcum anticum longitudinaliter profunde breviter canaliculato, lateribus ante sulcum anticum et inter sulcos separatim rotundatis; elytris 10-seriatim foveolatis (seriebus 9ª et 10ª haud carina acuta divisis), foveolis fere a basi ad partem posticam tertiam continuis (hic subito desinentibus), parte apicali subtiliter vix seriatim punctulata, serierum interstitiis a foveolarum interstitiis transversis tubatis; tibiis extus longitudinaliter carinatis. Long., 4—4⅛ l.; lat., 1⅛—1⅜ l.

This species bears much general resemblance to that which I take to be *A. Plutus*, Chevr., but differs from it *inter alia* by the much shorter longitudinal channel of its pronotum, by the much less coarse sculpture of its elytra, and by the well-marked longitudinal carina that traverses the whole length of the external face of its tibiæ.

N.S. Wales (Inverell; given to me by the late Mr. Olliff).

A. mundus, sp. nov. Minus elongatus, minus convexus; læte cyaneus, antennis palpis et tibiis tarsisque anticis testaceis, tibiis tarsisque posterioribus 4 picescentibus; pilis sat elongatis fulvis vestitus; capite crebre ruguloso, inter oculos fovea profunda impresso, antennis prothoracem medium paullo superantibus, articulis 9° 10° que sat fortiter transversis 11° obovato; prothorace vix transverso, supra crebre rugulose punctulato, pone apicem arcuatim (et ante basin recte) sulcato, pone sulcum anticum longitudinaliter brevissime canaliculato, lateribus ante sulcum anticum et inter sulcos separatim rotundatis; elytris 10-seriatim foveolatis (interstitio inter series 9ªm et 10ªm ultra elytra media haud cariniformi), foveolis in parte basali obsoletis et subito ad partem apicalem tertiam desinentibus, parte apicali subtiliter vix seriatim punctulata, serierum interstitiis a foveolarum interstitiis transversis turbatis. Long., 3 l.; lat., 1 l.

Very closely allied to *A. amabilis*, Blackb., but satisfactorily distinguishable by the absence of the subscutellar gibbosity on

the elytra and the *sudden* ending of the seriate foveolæ of the elytra at the beginning of the apical one-third part of the elytra. There is also a difference in the apical joint of the antennæ on which in *A. amabilis* there is a distinct external excavation (but not in the present species). The seriate foveolæ of the elytra are in both very similar to those of *A. chrysurus*, Chevr. Also (disregarding colour) near to *A. corallipes*, Chevr., but differing from it *inter alia* by the seriate sculpture extending scarcely into the apical one-third of the elytra, while in *corallipes* it reaches nearly into the apical one-fourth.

S. Australia (Mount Lofty Range).

A. (*Clerus*) *delicatulus*, Bohem. I have taken an *Aulicus* in the Sydney neighbourhood which I have no doubt is Bohemann's species. It does not seem to present very strong characters, its most striking feature being I think the comparatively feeble sculpture of its elytra, which consists of rows of transversely quadrate impressions separated by continuous longitudinal interstices which are (not, as they are in *A. chrysurus*, Chevr., thrown out of shape or zigzagged by still stronger transverse interstices running continuously across several of the rows but) straight. In respect of that sculpture it resembles *A. nigrohirtus*, but in that species the foveæ are considerably larger and deeper, and the interstices (both longitudinal and transverse) are considerably stronger and more cariniform; in *delicatulus* the longitudinal interstices are almost flat, and carry a straight row of fine and not very closely placed punctures. The sculpture of the median part of the elytra does not in *A. delicatulus* abruptly cease or change its character at a more or less considerable distance from the apex (as it does in many species of *Aulicus*) but merely becomes near the apex a little feebler and less seriate. The hind tibiæ and tarsi are unusually slender, which suggests the idea that *A. viridissimus*, Pasc. (also from Sydney) may be a later name for the same insect. Pascoe's statement that in *A. viridissimus* the elytra are "coarsely" punctured in rows seems perhaps inconsistent with such identity, but the expression is not altogether inapplicable to the elytra of the insect before me *absolutely*, although *comparatively* (*i.e.*, compared with most other *Aulici*) the sculpture is not coarse. Some remarks seems to be called for on my having placed *delicatulus* in my tabulation (above) with *A. Plutus*, Chevr., as having the longitudinal channel of the pronotum exceptionally long, whereas Bohemann says of its pronotum "*breviter canaliculato.*" Bohemann calls it by the name "*Clerus*," however, and it is in comparison with that of other *Aulici* that I call the longitudinal channel of its pronotum elongate. Absolutely, the channel may be called "short" as it does not reach the base, and does not nearly reach the front margin, of the pronotum.

A. eremita, sp. nov. Elongatus, sat angustus, sat convexus; colore instabilis; antennis palpisque testaceis, pedibus obscuris, tarsis anticis plus minusve ferrugineis; pilis elongatis vestitus (his in capite pronoto elytrisque fulvis, alibi dilutioribus); capite inæquali, inæqualiter punctulato, longitudinaliter sat manifeste rugato, clypeo antice subtruncato quam inter oculos caput haud angustiori; antennis prothoracem medium manifeste superantibus, articulis 9° 10° que transversis 11° ovato ad apicem acuto; prothorace quam longiori vix latiori, supra inæqualiter subtilius punctulato et transversim subtiliter rugato, sat longe pone apicem arcuatim (et mox ante basin recte) sulcato, pone sulcum anticum longitudinaliter breviter vix perspicue canaliculato, lateribus ante sulcum anticum et inter sulcos separatim rotundatis; elytris 10-seriatim foveolatis (seriebus 9ª 10ª que ultra medium vix distinctis), foveolis a basi fere ad apicem continuis sed in parte quarta postica gradatim minus seriatis minus quadratis, serierum interstitiis a foveolarum interstitiis transversis multo turbatis. Long., 2¼ l.; lat., 1 l. (vix).

I found a batch of specimens of this insect on flowers on the Dividing Range in Victoria, which vary extremely in coloring, containing green, blue, coppery, and golden individuals. The legs are usually of the general colour,—but always dark, except the front tarsi which are more or less red. The antennæ palpi and pilosity do not vary in colour. Usually the whole surface is unicolorous, but in some examples the pronotum differs in colour from the elytra and the under surface from the upper. Among the species not having a variegated pattern on the elytra, having dark legs and testaceous antennæ, the ninth and tenth rows of elytral foveolæ confused behind the middle, the elytral sculpture not abruptly ceasing (or nearly so) considerably before the apex, the antennæ not reaching back to the base of the prothorax, and having the symmetry of the longitudinal interstices of the elytra much disturbed by transverse interstices continuous across several of the longitudinal interstices, this insect is distinguished by its clypeus being in front as wide as the interval between the eyes and its elytral sculpture being continuous quite to the base o the elytra. It is also notable by the unevenness of the surface of its head, and by its elongate somewhat cylindric form.

Victoria (Dividing Range).

A. amabilis, sp. nov. Minus elongatus, minus convexus; læte viridis, antennis palpis, tibiis anticis subtus et tarsis anticis testaceis; supra pilis elongatis obscuris et brevibus testaceis (alibi pilis elongatis pallidis) vestitus; capite sat plano, inter oculos foveato, æqualiter crebre ruguloso, clypeo antice fere

truncato quam interoculos caput haud angustiori; antennis prothoracem medium paullo superantibus, articulis 9° 10° que transversis 11° ovato ad apicem acuto extus leviter excavato; prothorace leviter transverso, sat æqualiter fere ut caput ruguloso, sat longe pone apicem arcuatim (et mox ante basin recte) sulcato, pone sulcum anticum late impresso (parte impressa in fundo longitudinaliter canaliculata), lateribus ante sulcum anticum et inter sulcos separatim fortiter rotundatis; elytris 10-seriatim foveolatis (interstitio inter series 9am 10am que parum ultra medium distincto), prope scutellum utrinque et ad humeros manifeste tumidis, foveolis (serie subsuturali excepta) in parte basali obsoletis et in parte apicali tertia confusis et minus distinctis nec manifeste quadratis, serierum interstitiis a foveolarum interstitiis transversis multo turbatis. Long., $2\frac{3}{8}$ l.; lat., 1 l.

In this species the discal sculpture of the elytra becomes confused and feeble towards the apex more rapidly than in the other species of the aggregate which I have tabulated as having this sculpture only *gradually* enfeebled,—so that it is somewhat intermediate between that aggregate and the next. Its general characters associate it with *A. eremita* from which it differs in many points (cited in the description), the most definite being perhaps that mentioned in the tabulation,—the seriate foveæ of the elytra commencing considerably behind the base of the elytra. It is a shorter and more depressed species than *A. eremita* and does not seem to vary in colour (I have half a dozen specimens taken in company). The part of the prothorax in front of the anterior transverse sulcus is so strongly rounded separately at its sides that the lateral outline of the prothorax (viewed from above) seems to have a deep emargination a little behind its front extremity. *A. parvulus*, Blackb., is somewhat closely allied to this and the preceding species (*A. eremita*), but is easily distinguished from them by *inter alia* its clypeus considerably narrower in front and strongly emarginate, and by the transverse interstices of its elytral foveæ being so strong and continuous as almost to conceal the existence of the longitudinal interstices.

Victorian Alps.

A. cribratus, sp. nov. Modice elongatus, minus convexus; supra cyaneus, antennis palpis et (tibiis tarsisque posterioribus nigris exceptis) pedibus testaceis; subtus cyaneus vel viridescens; pilis elongatis (his in corpore supra obscuris, in corpore subtus albidis) vestitus; capite confertim æqualiter ruguloso, inter oculos fovea impresso; antennis prothoracem medium parum superantibus, articulis 9° 10° que transversis 11° obovato ad apicem acuto; prothorace quam latiori sublongiori, ut caput punctulato, sat longe pone apicem

arcuatim (et mox ante basin recte) sulcato, pone sulcum anticum longitudinaliter brevissime canaliculato, lateribus ante sulcum anticum et inter sulcos separatim rotundatis; elytris 10-seriatim foveolatis (interstitio inter series 9^{am} et 10^{am} ultra elytra media haud cariniformi), foveolis per elytra tota fere continuis sed apicem versus haud quadratis minus crassis, serierum interstitiis a foveolarum interstitiis transversis turbatis. Long., 3½ l., lat., 1⅓ l.

This species is closely allied to *A. corallipes*, Chevr., but is certainly a distinct species. In a considerable number of specimens before me the hind tibiæ and tarsi are invariably black, the intermediate tarsi invariably black, and the intermediate tibiæ invariably more or less black. The few specimens I have seen of *corallipes* (from Tasmania) all have entirely red legs. There is also considerable and constant difference in the sculpture of the elytra which in *cribratus* begins close to the base and attains the apex, only becoming finer and less regular near the apex (so that this species has about the strongest apical puncturation of any in the genus); while in *corallipes* the sculpture begins considerably behind the base and changes suddenly at the commencement of the apical third of the elytra into a feeble non-rugulose puncturation.

S. Australia and N.S. Wales.

A. modestus, sp. nov. Angustus, elongatus, modice convexus; supra obscure æneus, antennis palpisque testaceis, subtus obscure cyaneus; pilis elongatis (his in corpore supra obscuris, in corpore subtus albidis) vestitus; capite antice crebre ruguloso, postice minus crebre punctulato, inter oculos fovea impresso; antennis prothoracem medium vix attingentibus, articulis 9° 10° que transversis 11° obovato ad apicem acuto; prothorace vix transverso, inæqualiter (in medio fortius sat crebre, apicem basinque versus subtilius sparsius) punctulato, in medio transversim rugato, sat longe pone apicem arcuatim (et mox ante basin recte) sulcato, pone sulcum anticum longitudinaliter minus breviter canaliculato, lateribus ante sulcum anticum et inter sulcos separatim rotundatis; elytris 10-seriatim foveolatis (interstitio inter series 9^{am}. 10^{am} que haud cariniformi), foveolis basin versus obsoletis apicem versus gradatim minus quadratis minus seriatis magis confertis, serierum interstitiis a foveolarum interstitiis transversis turbatis. Long., 3⅓ l.; lat., 1 l.

Var. (?immat.) pedibus sordide testaceis.

This species is closely allied to *A. eremita*, Blackb. It differs from that insect in colour which is (invariably in all the examples I have seen) dull bronzy above and blackish (tending to cyaneous) beneath, the antennæ and palpi testaceous, the front

tarsi somewhat ferruginous,—*eremita* being a brilliantly coloured and much more nitid insect. In *eremita* the seriate sculpture of the elytra reaches the actual base without any enfeeblement whatever so that there is no indication of the base of the elytra being more nitid than the rest of the surface, while in *modestus* on the basal portion of the elytra the seriate sculpture becomes very faint and sparse, so that that region is conspicuously more nitid than the general surface. In *eremita* the transverse carinæ separating fovea from fovea in the series are stronger than in *modestus* and more elongate (a greater number of them being continuous across several series of foveolæ), causing the elytra to appear very manifestly more coarsely rugulose; and in *eremita* the whole surface of the head is vaguely uneven, while in *modestus* the surface of the head is flat with merely a single fovea-like impression between the eyes.

S. Australia and Victoria.

SCROBIGER.

Chevrolat (Rev. et Mag. de Zool., 1874, p. 34) refers *Opilo mœrens*, Westw., to this genus. His statement does not appear to have been founded on an inspection of the type, and I believe it to be erroneous. According to the size given by its author it is a very much smaller insect than any known *Scrobiger*, and *inter alia* its pronotum is very differently sculptured from that of other species of that genus and its palpi are all subequal. I presume that Chevrolat's reason for regarding *mœrens* as a *Scrobiger* is Westwood's calling its elytra in the front part "rude punctato-striata." This phrase, however, is used by Westwood for elytra (*e.g.*, those of *Cleromorpha*) which are infinitely less coarsely sculptured than those of *Scrobiger*. Westwood's locality for *mœrens* is Adelaide, and I think I am fairly well acquainted with the *Cleridæ* of the Adelaide district. I have seen only one *Clerid* which agrees with Westwood's description, viz., the introduced *Tarsostenus univittatus*, Rossi, and that insect agrees with it very well and occurs near Adelaide. I have no doubt, therefore, that the name *Opilo mœrens* must be regarded as a synonym of *T. univittatus*.

NEOSCROBIGER (gen. nov. *Cleridarum*).

Palporum articulus apicalis securiformis; caput breve; labrum transversum antice emarginatum; antennæ modicæ (prothoracis basin vix superantes), clava sat laxe 3-articulata; oculi modici, supra inter se distantes, subtiliter granulati, transversim subreniformes; prothorax sat elongatus, postice angustum tubuliformis, supra pone apicem transversim sulcatus; elytra sat elongata, quam trans basin lata plus quam duplo longiora, æqualia, in parte apicali fere dimidia

sublævia; pedes sat elongati, femoribus posticis elytrorum apicem plane vel fere attingentibus tarsis 5-articulatis, articulo basali (tarsorum omnium) superne haud manifesto, articulo ultimo robusto præcedenti parum exserto, unguiculis parvis simplicibus divaricatis; corpus modice elongatum, capillis erectis vestitum.

Type *Opilo patricius*, Klug (*sexnotatus*, Westw.).

O. patricius, Klug, cannot be rightly placed in any hitherto characterised genus. Its finely granulated eyes separate it strongly from *Opilo;* its tarsi (all apparently four-jointed,—owing to the basal joint being concealed,—when viewed from above), the securiform apical joint of its maxillary palpi, and its pronotum transversely sulcate near the front, in combination associate it with the *Scrobiger* group of genera. Among those genera its mesosternum not vertical in front, its elytra neither fasciculate nor tuberculate and having a large apical space nitid and almost unpunctured, and its form (the elytra considerably more than twice as long as at the base wide) are sufficient to distinguish it.

Characters such as these appear to me certainly entitled to be treated as generic in the *Clerideæ*, a family in which many structural characters seem to be of less value than they are in most families, *Metabasis* and *Thanasimomorpha*, e.g. (also *Tarsostenus* and *Paratillus*) being so much like each other respectively that it seems strange to separate them widely, and yet having a totally different tarsal structure one from another. No doubt structural differences must have their full weight, and it is out of the question to associate under one generic name species having such, but much study of the Australian *Clerideæ* satisfies me that it is also out of the question to associate under one generic name (at least as far as the Australian *Clerideæ* are concerned) species differing widely in facies and sculpture because one cannot find important differences in the structure of the eyes, palpi, tarsi, &c. *Aulicus*, *Trogodendron*, *Scrobiger*, and the present genus, undoubtedly resemble each other closely in structural characters, but each has so distinctive and constant a facies and type of sculpture that it seems unreasonable to merge any two of them under one generic name. Probably when their life histories and habits are fully known it will be found that each of these genera mimics the facies of the group of insects on which it is parasitic.

N. raucicepe, sp. nov. Sat elongatus, postice sat dilatatus; sat nitidus; æneo-niger, labro antennis palpis tibiis tarsisque rufis, elytris ante medium macula discoidali et ad medium fascia sat lata albidis ornatis (parte apicali rufescenti dense albido pubescenti); capite confertim subgrosse ruguloso,

palporum maxillarium articulo ultimo leviter securiformi, antennis prothoracis basin paullo superantibus; prothorace quam latiori vix longiori, supra antice ut caput (in disco retrorsum gradatim minus crebre) ruguloso, inæquali (antice angulatim mox ante basin recte transversim sulcato, pone sulcum anticum impresso, ante basin 3-tuberculato), lateribus mediis fortiter rotundato dilatatis; elytris a basi ultra medium seriatim sat grosse foveolatis, alibi lævibus. Long., 4 l.; lat., $1\frac{1}{10}$ l.

Much resembling *N.* (*Opile*) *sexnotatus*, Westw., but with the apical joint of the maxillary palpi so feebly securiform as to suggest generic distinction. Compared with *sexnotatus* the markings on the elytra are whitish instead of yellow, the subapical spot wanting but the whole apex faintly reddish and densely clothed with whitish pubescence; the femora entirely dark; the head and pronotum much more strongly rugulose, the surface of the latter being considerably more uneven behind; the elytra narrower at the base and consequently more dilated near the apex. I do not find any structural difference between this species and *sexnotatus* except that in the maxillary palpi and a trifle less elongation of the hind femora.

Victoria (Dividing Range).

EBURIPHORA.

This generic name must be removed from the Australian Catalogue, as its presence there rests on the authority of Klug's *Opilus patricius* having been referred to *Eburiphora*. This Tasmanian insect is clearly identical with Westwood's *O. sexnotatus* (also from Tasmania,—a species discussed above) and is certainly not an *Eburiphora* (*inter alia* it has not appendiculate claws). As Klug's is the older name the species must be known as *patricia*, Klug.

TARSOSTENUS.

I do not believe that any member of this genus is native to Australia. I have myself taken and recorded the occurrence of *T. univittatus*, Rossi, near Adelaide, but it is no doubt introduced from some other country. The following notes relate to the three really Australian species that have been attributed to the genus.

T. Mastersi, Macl. The description does not read at all like that of an insect very closely resembling *Tarsostenus*; and if Macleay's statement "eyes coarsely granulate" be correct, the word "coarsely" being used in the sense Lacordaire uses it of *Clerid* genera, the species cannot be placed even near *Tarsostenus*.

T. zonatus, Blanch. This species is certainly identical with *Paratillus* (*Clerus*) *carus*, Newm. Newman's name has priority.

T. pulcher, Macl. The description of this insect does not

suggest the idea of a *Tarsostenus;* indeed Macleay himself says that the insect has the appearance of a *Tillus.* I suspect, however, that it is congeneric with the species described below as *Tarsostenodes simulator.*

TARSOSTENODES (gen. nov. *Cleridarum).*

Palporum articulus apicalis securiformis; labrum transversum antice emarginatum; antennæ modicæ (prothoracis basin vix superantes), clava 3-articulata distincta articulis præcedentibus 4 conjunctis longitudine sat æquali; oculi modici, supra inter se sat distantes, fortiter convexi, sat subtiliter granulati, subrotundati, antice emarginati; prothorax elongatus, antice elongato-globulosus postice sub-tubuliformis (*Homœmotæ* prothoracem simulans); elytra longissima angusta apicem versus sat abrupte (nonnihil globulose) dilatata, nec tuberculata nec fasciculata, notulis eburneis, ornata; pedes sat elongati, femoribus posticis elytrorum apicem haud attingentibus, tarsis 5-articulatis, articulo basali (tarsorum omnium) superne haud manifesto; unguiculis subappendiculatis; corpus angustissimum, capillis erectis vestitum.

The insect for which I propose this name mimics in a very remarkable manner Longicorn genera such as *Homœmota* or *Zoedia*, in company with which I found it on flowers. I think it should be placed near *Tarsostenus*, from which *inter alia* the raised ivory-like markings on its elytra readily distinguish it. *Clerus guttulus*, White, is a member of this genus.

T. simulator, sp. nov. Subopacus; læte viridis, labro palpis antennis pedibus scutello et pectore rufo-testaceis, elytris (basi apiceque late viridibus exceptis) rufo-cupreis, his lineis elevatis eburneis binis obliquis ornatis (sc. linea brevi antemediana a margine externo retrorsum, et linea longiori postmediana a margine externo antrorsum, directis); capite pronotoque confertim subtilius rugulosis; elytris a basi ultra medium æqualiter vix lineatim confertim sat grosse (alibi quam pronotnm paullo magis subtiliter) rugulosis. Long., 4 l. (vix); lat., 1 l.

Very different from *T.* (*Clerus*) *guttulus*, White, in its colours and markings; also, *inter alia*, by the notably wider club of its antennæ.

Victoria (Dividing Range).

HYDNOCERA.

This generic name must drop out of the Australian Catalogue, *H. bella*, Westw., having been recently shown by Herr Schenkling (Deutsch. Ent. Zeit, 1898, p. 180) to be a *Lemidia*.

PYLUS.

P. anthicoides, Newm., has been stated by Gorham (Tr. Ent. Soc., Lond., 1878, p. 154) to be an African species,—an assertion that is accepted by Lohde in his recent Catalogue. Newman certainly implies that it is Australian. Probably he was in error as to the place of capture,—or the specimen was an accidentally imported one. I have not seen any Australian *Clerid* agreeing with Newman's description.

TENEBRIONIDÆ.

HYPOCILIBE.

H. veternosa, sp. nov. Late ovata; minus opaca; nigra, antennis apicem versus et tarsis subtus picescentibus; vix perspicue punctulato; clypeo utrinque vix perspicue impresso, antice late manifeste emarginato; prothorace quam longiori ut 16 ad 9 (postice quam antice, ut 8 ad 6) latiori, antice modice emarginato (margine antico in parte mediana late recto), fortiter (a latere viso) convexo, lateribus modice arcuatis postice sinuatis, angulis anticis minus (posticis fortiter) acutis; scutello perlato, utrinque postice late profunde impresso; elytris (a latere visis) valde convexis, leviter reticulatim strigosis, quam prothorax ut 12 ad 8½ latioribus, lateribus rotundatis anguste reflexis, postice alte declivibus; tibiis intus haud tomentosis; coxis anterioribus 4 pubescentibus. Long., 8 l.; lat., 4½ l.

Differs from *H. Macleayi*, Bates, by the elytra without any trace of costæ (even at the suture) and from *H. impunctata*, H. Rutenb., by the very distinct (though faintly impressed) reticulation of the elytra which is due to the presence of numerous wrinkles irregularly traversing the surface. The strongly convex form of the pronotum causing its outline (viewed from the side) to appear very strongly declivous in its hinder one-fourth, the extremely convex elytra (with their greatest height—viewed from the side—considerably behind the middle), the clypeus distinctly emarginate in front, the scutellum deeply excavated on either side in the hinder part, and the densely pubescent anterior 4 coxæ, are characters that in combination distinguish this species from all its described congeners (excluding the two already mentioned,—of which I have not seen examples). It is nearest to *H. heroina*, Blackb., which, however, is a much larger and more nitid insect, with the clypeus rounded in front, the surface of the scutellum even, the reflexed edging of the elytra notably wider, &c., &c.

S. Australia (Basin of Lake Eyre); taken by Herr Koch near Farina.

CURCULIONIDÆ.

ALCIDES.

A. terræreginæ, sp. nov. Sat parallelus; sat cylindricus; castaneus, prothorace antennis tarsis et corpore subtus obscurioribus; pronoto ad latera dense albo-squamoso; elytris maculis quinis albo-squamosis ornatis (sc. 1ª basali lineari longitudinali in interstitio 3° sita, 2ª parva in interstitio 7° hujus ad longitudinis medium sita, 3ª post-mediana in interstitio 3° sita, 4ª quam 3ª vix posteriori in interstitio 7° sita, 5ª subapicali in interstitio 4° sita), corpore subtus plus minusve dense albo-squamoso; rostro modice elongato leviter arcuato; prothorace quam in medio longiori paullo latiori, subquadrato, sat crebre ruguloso; scutello punctiformi; elytris striatis, striis grossissime nec crebre punctulatis, interstitiis sat angustis sat rugulose punctulatis; femoribus subtus dente magno serrato armatis; tibiis arcuatis; segmento ventrali 2° quam 3ᵘˢ paullo longiori. Long. (rostr. excl.) $2\frac{4}{5}$ l.; lat., 1 l.

This little species is very distinct from all its congeners of which I have been able to see the descriptions; from all its described Australian congeners it differs widely, *inter alia*, by the markings of its elytra, which consist of 5 spots on each elytron, one of them being an elongate line on the basal portion of the 3rd interstice and there being no spots on the suture or lateral margins. In shape it closely resembles *A. brevicollis*, Pasc. (as figured in Ann. Mus. Gen., 1885, T.I., fig. 7), but with the prothorax very much less transverse. In one of the examples before me there are traces of a scaly spot near the middle of the base of the pronotum.

Queensland (near Charters Towers).

ANTHRIBIDÆ.

This family is somewhat numerously represented in Australia, though but few of its genera seem to be plentiful in species and but few of its species plentiful in individuals. Its Australian genera (including the new ones I form in the following pages) having more than doubled in number since the issue of Masters' Catalogue in 1886, it seems desirable to furnish a table showing their relation *inter se*. In trying to meet this requirement I have in the main followed the lines of Lacordaire's classification, adopting his principal division based upon the position of the scrobes in which the antennæ are inserted, and also his principal division of the larger group (*Pleurocères*,—having the scrobes lateral) into two aggregates with the transverse carina of the pronotum (*a*) antebasal (*b*) basal. Lacordaire's principal character for dividing the second main group (*Anocères*) does not at present

concern us, since the second aggregate of that group has not been reported as Australian. Beyond this I have not strictly followed Lacordaire, as his principal (so far as concerns the Australian *Anthribidæ*) subdivisions of the two main aggregates of the *Pleurocères*,—based on the width of the rostrum at its base and the more or less cylindric form of the body,—seem to shade off into each other in a somewhat perplexing manner. [Lacordaire, *e.g.*, tabulates the true *Anthribides* as of oblong or oval,—contrasted with cylindric,—form, but in the detailed diagnoses of their genera calls some of them "almost cylindric," "subcylindric," and even unreservedly "cylindric."] I have adopted in the place of those characters others which Lacordaire treats as subordinate to them, founded on (*a*) the relation between the upper and lower edge of the rostral scrobe, in the one case the lower edge protruding outwards further than the upper edge or the upper edge cutting into the lateral margin of the rostrum, so that the scrobe is visible from above; in the other case the upper edge not cutting into the lateral margin of the rostrum and the lower edge not protruding outwards beyond the upper, and the scrobe consequently being entirely invisible from above (*b*) the form of the eye.

Of the *Anthribid* genera known as Australian I have been able to include in the following tabulation all except *Telala*,—which is a genus characterised by Mr. Jordan (Ent. Z. Stett, 1895, p. 143). I do not think that it is represented among the *Anthribidæ* before me, and as its author does not say whether the rostral scrobes are visible from above I cannot place it in my tabulation without seeing it. It is founded on a species of moderately large size, with spinose elytra.

Tabulation of the *Anthribid* genera known to be Australian:—

A. Antennæ inserted on the side of the rostrum.
  B. A transverse carina (independent of the base) on the pronotum.
    C. Prosternum and mesosternum elevated and contiguous ... ... Bythoprotus.
    CC. Prosternum and mesosternum not as in *Bythoprotus*.
      D. Rostral scrobes visible from above, and not basal vertical and sulciform.
        E. Eyes small and very elongate.
          F. Carina of pronotum strongly arched ... Ancylotropis.
          FF. Carina of pronotum straight ... ... Genethila.
        EE. Eyes not as in the preceding two genera.
          F. Eyes approximate on the forehead ... Litocerus.
          FF. Eyes lateral, and distant from one another.
            G. Carina of pronotum straight ... ... Ethneca.
            GG. Carina of pronotum strongly arched ... Commista.
      DD. Rostral scrobes not visible from above unless they are basal vertical and sulciform.
        E. Eyes entire or nearly so.

F. Rostral scrobes slightly visible from above, basal, vertical, and sulciform.
G. Club of antennæ 4-jointed ... ... Eucorynus.
GG. Club of antennæ 3-jointed ... .. Ecelonerus.
FF. Rostral scrobes quite invisible from above.
G. Rostral scrobes distinctly sulciform.
H. The rostrum forms a perfectly even surface with the head ... ... Entromus.
HH. The rostrum is on a different plane from the head ... ... Epargemus.
GG. Rostral scrobes foveiform.
H. Metasternum not extremely short.
I. Antennæ notably shorter than head and prothorax.
J. Joint 9 of antennæ scarcely wider than 8 ... ... Enspondus.
JJ. Joint 9 of antennæ as wide as joint 10.
K. Antennal club compact ... Tropideres.
KK. Antennal club loosely articulate ... ... Apatenia.
II. Antennæ considerably longer than head and prothorax ... ... Cacephatus.
HH. Metasternum extremely short ... Xynotropis.
EE. Eyes strongly emarginate ... ... Xenocerus.
BB. The transverse carina of the pronotum coincides with the base (at any rate in the middle).
C. Rostral scrobes strongly sulciform; antennæ notably shorter than head and prothorax ... Basitropis.
CC. Rostral scrobes and antennæ not as in *Basitropis*.
D. Front coxæ widely separated from one another.
E. Rostrum emarginate at apex and not forming an even surface with the head ... ... Phlœobius,
EE. Rostrum truncate at apex and forming an even surface with the head ... ... Streneoderma.
DD. Front coxæ subcontiguous or very narrowly separated.
E. Antennæ not reaching the base of the prothorax, and more or less stout.
F. Rostral scrobes visible from above ... Ozotomerus.
FF. Rostral scrobes not visible from above ... Cratoparis.
EE. Antennæ reaching much beyond base of prothorax (at any rate in male) and extremely slender.
F. Joint 3 of antennæ at least twice as long as 1 and 2 together.
G. Basal joint of hind tarsi notably longer than 2 and 3 together ... ... Exillis.
GG. Basal joint of hind tarsi about equal to 2 and 3 together... ... ... Euciodes.
FF. Joint 3 of antennæ about equal to 1 and 2 together ... ... Notæcia.
AA. Antennæ inserted on the upper surface of the rostrum.
B. Eyes rounded or widely oval, somewhat finely granulate.
C. Apex of front tibiæ with a strong spine perpendicular to the axis of the tibia ... ... Aræocorynus.
CC. Apex of front tibiæ normal.

D. Eyes very large and prominent. Antennæ equal in length to two-thirds of body ... Misthosima.
DD. Eyes much smaller and less convex. Antennæ half as long as body.
E. Front tarsi very long and wide ... ... Doticus.
EE. Front tarsi much shorter and narrower ... Arsæocerus.
BB. Eyes narrow and elongate, coarsely granulate ... Arsæocerodes.

EUCORYNUS.

The following species seems to belong to this genus, which has not as yet been recorded as Australian. The presence of an ante-basal carina on its pronotum together with the width of its rostrum (not narrower at its base than the head) and the sulciform character of its antennal scrobes refer it to M. Lacordaire's "groupe" *Ecelonerides*. In that "groupe" the four-jointed club of its antennæ refers it to *Eucorynus*, and I do not find anything in M. Lacordaire's diagnosis of the genus inconsistent with the characters of the insect described below, except in the antennæ of the insect being somewhat shorter than they should be according to the diagnosis.

E. Mastersi, sp. nov. Cylindricus; nigro-piceus, antennis (clava excepta) tarsisque rufis; pube picea vestitus, hac pube alba et setulis erectis piceis et aliis albis maculatim variegata; capite rostroque crebre subgrosse æqualiter punctulatis; pronoto leviter transverso, ut caput punctulato, antice fortiter angustato, lateribus sat arcuatis; elytris leviter striatis, striis fortiter nec crebre punctulatis, interstitiis planis vix perspicue punctulatis; antennis robustis prothoracis basin attingentibus, articulis 1° 2° que quam 3us paullo brevioribus, 4° 3° sat æquali, 5°—7° paullo brevioribus, 8°—11° clavam compactam depressam (hac quam articuli 4us—7us conjuncti paullo breviori) formantibus. Long., 4 l.; lat., $1\frac{3}{8}$ l.

The erect setæ are fine and recurved and are piceous or white according to the colour of the depressed pubescence among which they are situated. The white spots are,—about 5 moderately large on the head, a considerable number (all small) on the pronotum, a considerable number (all small except a larger one on the shoulder) on the front half of the elytra, and a large one and a number of small ones on the apical one-third of the elytra. The tibiæ and abdomen are prettily variegated with piceous and white pubescence, and there is much scattered white pubescence on the rostrum. The two examples before me are probably females, which may account for their antennæ being shorter than in the specimens of *Eucorynus* examined by Lacordaire, which he believed to be males.

Queensland; sent to me by Mr. Masters and Mr. Cowley.

ENTROMUS (gen. nov. *Anthribidarum*).

Caput transversum; rostrum planum depressum, quam latius sublongius, antice emarginatum, ad basin quam caput haud angustius, scrobibus obtectis foveiformibus sed oblique retrorsum (ut sulci male definiti) productis; antennæ graciles, prothoracem medium paullo superantes, articulis basalibus 2 paullo incrassatis (2° quam 1us multo longiori), 3° 2° longitudine æquali, 3°—8° gradatim brevioribus, 9°—11° clavam oblongam formantibus, 9° obconico vix transverso, 10° brevi sat transverso, 11° leviter transversim obovato; oculi parvi integri sat subtiliter granulati; prothorax vix transversus, vix inæqualis (basin versus transversim rugatus), sat convexus, antice minus fortiter angustatus, carina antebasali male definita cum rugis transversis adjacentibus subconfusa, in prothoracis lateribus vix perspicue producta; scutellum sat parvum; elytra lata depressa, inæqualia, leviter striata, striis punctulatis; coxæ anticæ appoximatæ inter se; pedes modici, inter se sat æquales; tarsi breves, articulo basali quam 2us parum longiori, 3° in 2° inserto; unguiculi subtus dente armati; metasternum modicum; pygidium (exempli typici) elytris tectum; corpus pubescens.

This genus is difficult to place in Lacordaire's scheme of classification, although it seems to me unnatural to place it far from *Tropideres*. But according to Lacordaire the fact of its rostral scrobes being certainly not simply foveiform would remove it from the "groupe" "*Tropiderides*." These are almost exactly as in *Ecelonerus* in outline, but differ in commencing in a foveiform excavation, the wall of which is interrupted at its postero-interior portion from which a shallow somewhat ill-defined sulcus emerges and simulates the deep strongly defined sulcus of *Ecelonerus*. The short wide depressed form of the type of this genus removes it, however, according to M. Lacordaire, from the *Ecelonerides*. The structure of the basal part of the pronotum is unlike that of any other Australian *Anthribid* known to me, the ante-basal carina appearing merely as one (a little more conspicuous than the rest) of several fine transverse ridges, and (though very distinct and well-defined near the lateral margins of the pronotum) becoming very faint as it approaches the middle line of the pronotum. From *Tropideres* itself it differs, *inter alia*, by the greatly elongated 2nd joint of its antennæ. I believe the specimen before me to be a male, but am not sure. *Tropideres musivus*, Er., and *albuginosus*, Er., are probably congeneric with this insect, but the descriptions of those species seem to indicate a different arrangement of the inequalities of the elytra, &c.

E. dorsoplagiatus, sp. nov. Piceus, pube picea albaque variegatus; hac rostrum scutellum que dense vestienti et in elytris maculam magnam quadratam communem formanti; antennis pedibusque rufis, his pube picea et alba variegatis; rostro longitudinaliter 3-carinato; prothorace inæqualiter rugulosopunctulato, dorso obsolete inæquali; elytrorum interstitiis 3° 5° que carinatis, parte posticali subverticali, interstitiis 3° 5° que mox ante declivitatem posticam valde callosis, inter hæc interstitio 4° rufo, interstitiis alternis (parte maculam dorsalem albam ferenti excepta) tuberculis parvis nigris instructis; macula dorsali alba maculis parvis nigris perpaucis interrupta et ad latera crenulata. Long., 3½ l.; lat., 1½ l.

The common white spot on the elytra is so densely pubescent that the underlying sculpture is entirely concealed. The spot occupies in its front all the width between the seventh interstices of the two elytra but narrows a little to its apex where it occupies the width between the two fifth interstices. Its front margin is a little behind the base of the elytra but in its middle runs forward triangularly to the scutellum; its sides are somewhat zigzagged, being cut into most conspicuously by a black spot a little behind the middle; its apex (a little in front of the hind declivity) is arcuately and irregularly emarginate and its surface is interrupted by a few very small black spots. The red pubescence near the apex of the elytra is not entirely confined to the fourth interstices but appears as spots on some of the other interstices, and there is also a little white pubescence near the apex. The third and fifth interstices of the elytra are a little more strongly elevated near the base than in the middle of their length. It is (as already noted) very probable that *Tropideres musivus*, Er., and *albuginosus*, Er., are congeneric with this insect. Assuming them to be so this insect differs from them specifically,—from *musivus*, *inter alia*, by its considerably larger size, by its not having three fascicles of pubescence on its prothorax and by the proportions of its antennal joints,—from *albuginosus*, *inter alia multa*, by its antennæ not long enough to reach the base of the prothorax.

Victoria; sent to me by Mr. Kershaw.

EPARGEMUS (gen nov. *Anthribidarum*).

Caput transversum; rostrum planum, depressum, quam latius vix longius, cum capite nullo modo continuum, mox ante basin angustatum (et hic quam inter oculos caput subangustius), hinc antrorsum ad apicem gradatim dilatatum, antice truncatum, scrobibus obtectis foveiformibus sed oblique retrorsum (ut sulci male definiti) productis; antennæ sat robustæ, prothoracem medium vix superantes, articulis

basalibus 2 leviter incrassatis (2° quam basalis vix breviori), 3° quam 2us manifeste longiori, 3°—8° gradatim brevioribus, 9°—11° clavam oblongam formantibus, 9° vix transverso, 10° brevi transverso, 11° vix transverso quam 9us vix breviori; oculi sat magni, integri, sat subtiliter granulati; prothorax transversus, vix inæqualis, sat convexus, antice et postice fortiter angustatus (margine antico quam basis sat angustiori), carina antebasali bene definita retrorsum in medio angulata in prothoracis lateribus vix perspicue producta; scutellum parvum; elytra convexa, inæqualia, leviter striata, striis subtiliter sat crebre punctulatis; coxæ anticæ inter se manifeste separatæ; pedes modici, inter se sat æquales; tarsi modici, articulo basali quam 2us sat longiori, 3° in 2° inserto; unguiculi subtus dente parvo armati; metasternum minus breve (quam segmentum ventrale basale vix longius); pygidium manifestum; corpus pubescens.

This genus is difficult to place in Lacordaire's arrangement. Its rostral scrobes are much like those of *E. dorsoplagiatus*, being of oblong form and running hindward obliquely on the under surface of the head, but scarcely long and deep enough to be called unreservedly "sulciform." It is difficult to say whether Lacordaire would have placed it in the groups having the base of the rostrum narrower than the head, the rostrum being scarcely (but nevertheless a little) narrower a little *in front* of the base than the head between the eyes. To me it appears that it ought not to stand far from *Tropideres*, although a strict application of Lacordaire's tabulation-characters would place it in the "*Phlœophilides*," but in the diagnosis of that "groupe" "scrobes découvertes" is one of the characters, which they certainly are not in this genus—nor does the species before me agree in its general characters or facies with any genus known to me of that group. I believe the specimen on which I have founded this genus to be a male.

E. marmoratus, sp. nov. Picea, pube nigricanti ochrea et alba variegata, antennis (clava excepta) et pedibus (plus minusve) rufescentibus; capite rostroque (his haud continue planis) crebre rugulose punctulatis, rostro longitudinaliter obsolete carinato; prothorace quam longiori fere ut 4 ad 3 latiori, supra longitudinaliter sat dense rugato, lateribus ab apice longe ultra medium arcuatim divergentibus hinc ad basin fortiter convergentibus,—elytris inter humeros et scutellum (et in humeris) callosis, interstitiis alternis leviter convexis et tuberculis nonnullis parvis instructis; corpore subtus sat æqualiter albido-pubescenti; pedibus maculatim albo- et piceo-pubescentibus.

Var pubis pallidæ colore brunneo-testaceo. Long., 2⅔ l.; lat., 1 l.

In a fresh specimen the sculpture of the derm is almost entirely concealed by the pubescence, even the callosities near the base of the elytra being scarcely discernible; these are not strongly marked even in an abraded example; that between the scutellum and the shoulder is the larger, and appears feebly bifid from some points of view. The pattern formed by pubescence of different colours is extremely intricate and difficult to describe. The rostrum is entirely clothed with pale pubescence; on the head dark, pale, and ochreous pubescence are vaguely intermingled; on the pronotum the middle of the disc and base is dark with a few pale spots, the front and sides being mostly pale with some dark patches; the pubescence of the front two-thirds of the elytra is dark, irrorated with pale hairs, which are condensed (interruptedly) along some of the alternate interstices and in small spots near the sides; the apical one-third of the elytra is occupied by a large common patch (which however does not reach the margins) of pale pubescence, close to the lateral margins of which (and about their middle) is a conspicuous dark spot, while another conspicuous dark spot occupies the sutural apical space on each elytron. The small indistinct tubercles on the alternate interstices are clothed, some with ochreous, some with very dark, pubescence. In an absolutely unabraded specimen the front part of the fifth interstice appears more strongly elevated than the other interstices, but this seems to be due to longer and closer pubescence, as I do not find it in abraded specimens. The greatest dilatation of the sides of the prothorax is at the extremities of the ante-basal carina, from which point the sides converge both forward and hindward.

Victoria and N.S. Wales (specimens in the S.A. Museum are without indication of habitat, but are probably from S.A.).

ENSPONDUS (gen. nov. *Anthribidarum*).

Caput transversum; rostrum depressum planum, cum capite haud continuum, breve, transversum, quam caput haud angustius, scrobibus lateralibus, magnis, foveiformibus, obtectis; antennæ modicæ, prothoracem medium paullo superantes, articulis basalibus 2 quam sequentes robustioribus (2° quam 1us paullo longiori), 2°—5° longitudine sat æqualibus, 6°—8° paullo brevioribus, 9° quam 8us paullo longiori sed parum latiori, 10° 11° que clavam formantibus quam 9us duplo latioribus, 10° vix 11° haud transversis, 11° obconico; oculi modici integri, sat subtiliter granulati, inter se late separati; prothorax vix transversus, valde inæqualis, sat convexus, antice fortiter angustatus, carina antebasali basi sat approximata bene definita leviter antrorsum arcuata in prothoracis lateribus fere ad medium producta; scutellum parvum; elytra convexa, inæqualia, striata; coxæ anticæ

subcontiguæ; pedes modici, inter se sat æquales; tarsi sat elongati, articulo basali quam 2us sat longiori, 3° in 2° inserto; unguiculi subtus dente parvo armati; metasternum modicum (quam segmentum ventrale basale paullo longius); pygidium manifestum; corpus pubescens.

The insect for which I propose this generic name cannot be referred to any existing genus that I can discover. In Lacordaire's classification its place is in the "Groupe" *Tropiderides*. In his tabulation of the genera of that groupe its place is doubtful, the ante-basal carina of its pronotum having its convexity forward, but not nearly so strongly as in the genera he places in the aggregate distinguished by that character. Among them the tabulation would make it *Hypseus* (though its eyes are scarcely "very finely" granulate)—but *Hypseus* has very different antennæ, and eyes converging on the forehead. If the forward arch of the carina be regarded as too slight to place the insect in the *Hypseus* aggregate, Lacordaire's tabulation would make it doubtfully an *Apatenia*,—but that genus has eyes and antennæ like those of *Hypseus*,—*inter alia* joints 9 and 10 of the antennæ being equal to each other. The most striking character of the insect before me consists in there being only two joints in the club of its antennæ, joint 9 evidently belonging to the funiculus and being not much longer and wider than the eighth joint. Judging by the ventral segments (less convex and not overlapping the edge of the pygidium in one,—more convex and just covering the edge of the pygidium in another) I think I have both sexes before me, and if so there is little or no superficial sexual difference.

E. bigibbosus, sp. nov. Oblongus; piceus pube cinerea ochrea brunneaque variegata, antennis (clava excepta) pedibusque (his fusco-variegatis) rufescentibus; capite rostro pronotoque crebre subtilius rugulosis; hoc in disco paullo pone medium tuberculis 2 magnis fasciculatis ornato; elytris confertim subtilissime subaspere punctulatis, subtiliter punctulato-striatis, interstitiis alternis quam cetera vix magis elevatis (3° pone basin et in medio, 5° ante apicem, tuberculis singulis fasciculatis ornatis) et fasciculis parvis pilosis variegatis. Long., 2 l.; lat., $\frac{4}{5}$ l.

This insect is easily recognisable by the presence, on either side of the middle line of the pronotum, of a large tubercle bearing a fasciculus of hairs. There is a smaller fasciculated tubercle near the base and another about the middle of the 3rd elytral interstice, and also another near the apex of the 5th interstice. There are also very small fascicles (beneath which the derm is scarcely tuberculate) on the alternate interstices, most conspicuous on the subsutural interstice and becoming gradually less

so towards the lateral margins. The surface of a specimen in good condition is of an ashy colour, being densely clothed with brownish and whitish hairs very evenly intermingled. On this ashy ground the tubercles and fascicles show as dark spots, their vestiture being fuscous with an intermixture of ochreous. The whitish pubescence somewhat predominates along the central line of the pronotum, and in the form of a wide, very indistinct fascia, a short distance behind the base of the elytra. The pubescence so closely and thickly clothes the surface that its sculpture is entirely invisible, excepting the two large tubercles on the pronotum and the three smaller ones on each elytron. The scutellum is white. The tubercles are a little larger in some examples than in others.

S. Australia.

TROPIDERES (?)

It is with great hesitation that I refer to *Tropideres*, the minute *Anthribid* described below. Nevertheless, it seems to lack any character that would definitely exclude it from the heterogeneous aggregate of species which the genus, as characterised by M. Lacordaire, is made to contain, at any rate, unless the fact of the 2nd joint of its antennæ being much longer than the basal joint be in itself deemed sufficient. The following are its structural characters:—Head wide, rostrum scarcely transverse, at its base as wide as the head, scarcely emarginate in front, its sides parallel, its scrobes lateral foveiform and concealed, its plane not evenly continuous with that of the head; antennæ not long enough to reach the base of the prothorax, joint 1 short, joint 2 very evidently longer than 1, 3 a little longer and more slender than 2, joints 3-8 gradually shorter, 9-11 forming an oblong but compact club, 9 longer than 10, which is transverse; eyes fairly large and prominent, finely granulated and widely separated from each other; prothorax gently transverse, narrowed from base to front, but not strongly, its surface even, its antebasal carina arched with convexity hindward (very close to the base but distinct from it in the middle, forming a right angle with its lateral extension which is not strongly defined and does not very nearly reach the middle of the lateral margin); elytra slightly gibbous close to the base on the disc, but otherwise even or nearly so, obscurely punctulate striate; front coxæ almost contiguous to each other; legs somewhat short and of nearly equal length; tarsi moderately long, their basal joint considerably longer than the second; body convex, gently oblong-ovate, pubescent; metasternum on the middle line about as long as the basal ventral segment.

T. evanescens, sp. nov. Piceus, antennis (clava excepta) pedibusque rufescentibus; pube sat elongata albida disperse

vestitus; supra crebre minus subtiliter (in prothorace paullo magis subtiliter) aspere punctulatus; elytris indistincte punctulato-striatis. Long., $1\frac{1}{5}$ l.; lat., $\frac{1}{2}$ l. (vix).

I have described the characters of this insect (above) in discussing its generic position fully, and need not repeat them here. I do not think my example is abraded. Its upper surface is thinly clothed with rather long adpressed fine whitish hairs which are slightly condensed into two very indistinct fasciæ on the elytra, in front of and behind the middle. On the undersurface the pubescence is more even and slightly closer.

S. Australia; Eyre's Peninsula.

CACEPHATUS (gen. nov. *Anthribidarum*).

Caput sat breve; rostrum transversum, sat planum, cum capite haud continuum, ad apicem truncatum, ad basin quam caput haud angustius, scrobibus lateralibus magnis foveiformibus obtectis; antennæ corpus medium attingentes, robustæ, articulis basalibus 2 leviter incrassatis (2° quam 1us sublongiori), 3°—8° elongatis inter se subæqualibus, 9°—11° clavam laxam formantibus, 9° quam lato sat longiori, 10° quam 9us vix latiori sed brevi leviter transverso, 11° ovali; oculi magni integri subtilius granulati, antrorsum in fronte sat fortiter convergentes; prothorax leviter transversus, antrorsum fere a basi angustatus, æqualis, carina antebasali basi sat approximata bene definita retrorsum arcuata ad latera angulata (nullo modo acute) et antrorsum fere ad latera media producta; scutellum parvum; elytra sat convexa, late subcylindrica, sat æqualia, punctulato-striata; coxæ anticæ inter se anguste separatæ; pedes sat elongati (præsertim antici); tarsi sat elongati, articulo basali quam 2us multo longiori, 3° in 2° inserto; unguiculi subtus dente basali armati; metasternum modicum (quam segmentum ventrale basale parum longius); pygidium manifestum; corpus pubescens.

The insect for which I propose this name is evidently a member of Lacordaire's "Groupe" "*Tropiderides*," and in his tabulation of the genera it evidently stands with *Apatenia*, from which its long antennæ having their tenth joint transverse and very much shorter than the ninth, *inter alia*, distinguish it.

C. sericeus, sp. nov. Brunneus, pube albido-sericea vestitus; supra confertim subtiliter subaspere punctulatus; elytris ad basin singulatim leviter gibbis, minus fortiter striatis, striis subtilius sat crebre punctulatis, interstitiis vix subconvexis, sculptura postice obsoleta. Long., $2\frac{1}{2}$ l.; lat., 1 l.

The characters cited in the generic diagnosis need not be repeated here. There are three examples before me, all of which

appear to be somewhat abraded. It is manifest however that the whitish pubescence clothes the head and pronotum somewhat evenly. On the elytra the pubescence is interrupted by small patches of darker colour showing (in the examples before me) the derm, but I suspect that in a fresh specimen the dark spots are clothed with pubescence of the colour of the derm,—as I find some indication of such pubescence on some of the spots.

XYNOTROPIS (gen. nov. *Anthribidarum*).

Caput transversum planum; rostrum transversum planum cum capite omnino continuum, ad basin quam caput haud angustius, scrobibus foveiformibus obtectis; antennæ sat graciles, prothoracis basin attingentes, articulis basalibus 2 quam sequentes paullo robustiores (2° longiori), 2° 3° que inter se longitudine æqualibus, 5°—5° gradatim brevioribus, 6°—8° moniliformibus, 9°—11° clavam sat compactam formantibus, 9° 10° que inter se sat æqualibus fortiter transversis, 11° subgloboso; oculi modici, fortiter convexi, sat fortiter granulati; prothorax transversus sat æqualis, fortiter convexum, antice super caput fortiter anguste prominens, carina ante-basali bene definita arcuata retrorsum convexa in lateribus vix perspicue producta; scutellum parvum; elytra fortiter convexa, æqualia, sat breviter ovalia, punctulato-striata; coxæ anticæ inter se bene separatæ; pedes modici, inter se sat æquales; tarsi breves articulo basali (tarsorum anticorum vix, posticorum manifeste) quam 2us longiori, 3° in 2° inserto; unguiculi subtus dente acuto armati; metasteruum brevissimum; pygidium manifestum sat latum; corpus supra obscure metallicum, pilis elongatis adpressis maculatim ornatum.

The shape of the insect for which I found this genus (with its strongly convex oval elytra, somewhat suggesting the thought of *Otiorhynchus*) together with the metallic gloss of its surface, renders it very easy of identification. In Lacordaire's classification it falls into the "Groupe" *Tropiderides* by virtue of the following characters:—Antennæ inserted in the sides of the rostrum, ante-basal carina of pronotum present, rostrum short flat, and at base not narrower than the head, rostral scrobes foveiform, eyes entire, sides of rostrum sub-parallel. Its structural characters seem to place it near *Tropideres*, from which it differs by, *inter alia*, its general build and extremely short metasternum which is not longer on its middle line than the shortest of the ventral segments. The metasternum is moderately short in *Tropideres*, but not nearly so short as in this genus.

X. micans, sp. nov. Ovalis; sat nitida; supra picea, obscure aureo- et cupreo-micans; maculatim albido-pubescens;

subtus nigra, vix aurata, vix pubescens; antennis (clava excepta) pedibusque (femorum basi excepta) rufis; capite pronotoque confertim aspere punctulatis; elytris vix striatis, grossissime seriatim punctulatis; sternis fere ut pronotum, abdomine subtiliter, punctulatis. Long., 1½ l.; lat., ½ l.

The metallic glow on this species—though quite unmistakeable—is by no means brilliant; it is of an evidently coppery tone on the front part of the pronotum, but very little noticeable on the rest of that segment, and on the elytra is brassy. On the example before me (which I took myself and am confident is not materially injured by abrasion) the whitish pubescence is thinly and vaguely dispersed on the head and pronotum with very little tendency to be condensed anywhere, while it clothes the scutellum densely, and on the elytra forms a wide ill-defined lateral margin and some not very conspicuous dorsal blotches which range themselves somewhat in the form of two very arcuately transverse rows (their convexity directed forward), one behind the other in front of the middle.

Tasmania; Lake district.

BASITROPIS.

The Australian species of this genus appear to be entirely Northern in distribution and rare (as regards individual specimens) but probably numerous. I have before me six specimens which represent at least four and possibly six species. In five of them the markings of the upper surface are extremely similar while in one they are entirely different from those of the five. Three species have been described from Australia. In one of them (*solitarius*, Pasc.) the alternate interstices of the elytra are said to be "raised," which is not the case in any of the specimens before me. The descriptions of the other two are so meagre as to be almost useless. However one of my specimens agrees with the description (such as it is) of *B. ingrata*, Pasc., and may possibly be that insect,—but I cannot regard any of them as reconcilable with the description of *B. peregrina*, Pasc., which is represented as having "an obscure yellowish-grey band near the apex," consisting of pubescence, and being long., 3 l. The specimens before me (except that already mentioned as *B. ingrata ?*) are all decidedly larger and have *two* bands of pale-coloured pubescence neither of which is at all "obscure." I must consider therefore that I have not seen *B. peregrina* or *B. solitaria*.

In respect of its generic characters the diagnoses of *Basitropis* are very incomplete, owing to the want of detail as to sexual characters. Jekel (the author of the genus) does not refer to them, but his description and figure do not altogether agree with

Lacordaire's statement. The former says that the antennal club consists of three joints while the latter somewhat inconsistently states (in the generalities of the "Groupe") that in the male the club consists of four or five joints, and then in the formal diagnosis affirms that joints 6-8 are grudually transverse and that joints 9-11 form the club; and that the females can hardly be distinguished from the males except by their shorter antennæ. Turning to the specimens before me I find a slight difference in the structure of the ventral segments between two of them and the other four,—the two having those segments distincly though slightly depressed down the middle line and the apical ventral segment so related to the pygidium that when the ventral segments are looked at from directly above (the specimen being laid on its back) the edge of the pygidium can be seen beyond it, while the ventral segments of the other four are evenly convex and the apex of the apical segment just covers and conceals from sight the edge of the pygidium. The two specimens have antennæ in which joints 6-8 are so strongly and gradually dilated that it is difficult to say at which joint the club really begins (which might account for Lacordaire's contradictory statements),—while the antennæ of the other four have a distinctly three-jointed club and are I think females,—the two being males. I take it that Jekel founded the genus on the female, and that Lacordaire diagnosed a male and either failed to observe the antennæ of the female correctly, or regarded as male and female specimens that were really the males of two species.

The genus is a very well marked one among the Australian *Anthribidæ* by the unusual character of the antennal scrobes being basal and sulciform, in conjunction with the ante-basal carina of the pronotum wanting and the lateral carinæ continued nearly to the apex where they do not form an angle. I observe in all the specimens before me that the carinæ of the pronotum are finely and closely denticulate in their entire length but as this character is not referred to by Jekel or Lacordaire it may not be present in *B. nitidicutis*, Jekel (from India and Java), the typical species.

It is to be noted that M. Lacordaire describes under the name *Gynandrocerus* an African genus which he says differs from *Basitropis* only by the sexual antennal characters which approach those I have described above. If there is really no other difference between the two genera *Gynandrocerus* cannot stand.

B. relicta, sp. nov. Mas. Cylindrica; picea, pube densissima nigro-picea vestita, hac pube pallida partim testacea partim alba variegata; capite subgrosse sat crebre æqualiter punctulato; rostro fortiter transverso, inæquali, postice longitudinaliter obsolete canaliculato, antice arcuatim

emarginato; antennis robustis prothoracem medium paullo superantibus, articulis basali crasso superne nullo modo visibili, 2° quam basalis breviori minus crasso quam latiori vix longiori, 3° 4° que inter se sat æqualibus quam 2us sat longioribus, 5° quam 4us paullo breviori ad apicem dilatato quam latiori parum longiori, 6° intus ad apicem dilatato transverso quam 5us paullo breviori, 7° intus etiam magis dilatato quam longiori duplo latiori quam 6us vix breviori, 8° 7° similis sed paullo magis transverso, 9° 10° que inter se æquilatis (hoc paullo breviori) quam 8us parum latioribus, 11° breviter transversim subovato; oculis in fronte modice inter se approximatis; prothorace vix transverso, æquali, subgrosse minus profunde nonnihil acervatim punctulato, lateribus a basi longe ultra medium sat parallelis dein convergentibus; elytris striatis, striis fortiter nec crebre punctulatis, interstitiis planis; coxis anticis subcontiguis. Long., $4\frac{1}{2}$ l.; lat., $1\frac{3}{5}$ l.

The markings of the surface are caused by patches of pubescence different in colour from the ground. On the upper surface the pubescence forming the ground is of a smoky blackish tone; on the head and prothorax there are numerous small spots of testaceous brown; the scutellum is covered with white pubescence; on the elytra spots (very various in size) of white pubescence form two zones—one post-basal, the other ante-apical. The post-basal zone is an irregular common festoon of unequal spots with its ends on the shoulders; the ante-basal zone is on each elytron a transverse spot of irregularly triangular form—its base near but not touching the suture, its apex (which is truncate) near but not touching the lateral margin. Besides the two zones there are a few small white pubescent spots about the lateral margin and apex The undersurface and legs are densely clothed with pale grey very fine pubescence. On this ground coarse puncturation appears as dark spots on the sterna, there is an elongate spot of ochreous pubescence on the lateral margins of each ventral segment, and the legs are variegated with dark pubescence. Joints 9 and 10 of the antennæ are scarcely narrower than the interval between the eyes.

A specimen from N. Queensland may be the female of this species. Its antennæ are a trifle shorter than those of the described male and distinctly more slender, their basal 7 joints cylindric and not differing much in size except in the 4th being somewhat the longest, the 8th is distinctly dilated and transverse, joints 9—11 forming a club, and much like joints 9—11 of the male, but less dilated. The only differences that I observe (not already mentioned) from the male consist in the eyes being a little less approximate to each other, and the elytra having

(besides the zones of white pubescence) numerous small white pubescent spots sprinkled over the whole surface. On the whole I incline to think this specimen the female of a species distinct from that of which the male is described above.

An example from Port Darwin agrees with the above description of the male except in its smaller size (Long. $3\frac{3}{4}$ l.), and in the pale pubescence of its elytra being of a distinctly ochreous tone.

N. Queensland.

B. pallida, sp. nov. Fem. Sat cylindrica, postice paullo angustata; picea, pedibus antennisque rufescentibus; pube adpressa densissima testacea alba et fusca læte intermixta vestita; capite subgrosse sat crebre æqualiter punctulato; rostro sat fortiter transverso, longitudinaliter indistincte carinato, antice leviter emarginato; antennis minus robustis prothoracem medium paullo superantibus, articulis basali crasso superne nullo modo visibili, 2°—4° inter se sat æqualibus quam basalis longioribus, 5°—7° inter se sat æqualibus quam 4us sat brevioribus, 8° quam 7us paullo longiori antrorsum leviter dilatato, 9°—11° clavam formantibus, 9° 11° que inter se sat æqualibus vix transversis, 10° brevi fortiter transverso; oculis in fronte minus approximatis; prothorace sat æquali (longitudine latitudini æquali), fere ut caput punctulato, lateribus a basi longe ultra medium leviter (dein sat fortiter sinuatim) convergentibus; elytris leviter striatis, striis fortiter sat crebre punctulatis; corpore subtus pedibusque sat æqualiter dense albido-pubescentibus; coxis anticis inter se approximatis sed haud contiguis. Long., $4\frac{1}{2}$ l.; lat., $1\frac{1}{2}$ l.

The prevailing pubescence of the upper surface is of a pale testaceous brown colour; on this ground, white pubescence is distributed as follows,—dispersedly on the head and rostrum,—on the pronotum a line down the middle and an elongate patch on either side near the margins,—on the elytra a large humeral patch limited by an oblique line from the scutellum to the lateral margins at about a third of its length from the base, some small spots along the suture and lateral margins, and a large somewhat arcuate patch near the apex; pubescence of very dark colour forms the lateral margins of the pronotum and is continued a short distance along the margins of the elytra, forms a large basal spot in the basal white patch, a very small spot on the third interstice slightly behind the middle (just in front of the hindmost white patch) and a larger spot on the third interstice near the apex (within the arch of the hindmost white patch).

The colour and distribution of the markings in this species are entirely different from those of the other described species of

Basitropis (at any rate of all the Australian ones, and all other known to me). In respect of other characters not likely to be sexual it differs from *B. relicta, inter alia,* by its somewhat larger and less cylindric shape, the feeble emargination of the front of its rostrum, the more elongate form of its prothorax which is distinctly (though not much) narrower across its middle than across its base (in *relicta* that segment is if anything wider across its middle than its base), its evidently narrower rostrum, and the more evident interval between its front coxæ. It is to be noted, however, that in neither of the above species are the front coxæ separated by a continuous process of the prosternum.

Port Darwin (N. Territory of S. Australia). Taken by the late Dr. Bovill.

STRENEODERMA (gen. nov. *Anthribidarum*).

Caput transversum; rostrum transversum supra sat planum, ad apicem truncatum, ad basin quam caput haud angustius, scrobibus foveiformibus obtectis; submentum planatum profunde triangulariter emarginatum; antennæ graciles, articulis basalibus 2 quam sequentes robustioribus (2° breviori), articulis 3°—8° gradatim brevioribus, 9°—11° clavam distinctam formantibus, hac laxe articulata; oculi magni, fere integri, sat convexi, minus fortiter granulati; prothorax fortiter transversus, transversim fortiter convexus, carina antebasali nulla, carina basali ad latera angulata et antrorsum ad latera media producta; scutellum parvum; elytra sat brevia, striata, postice subverticalia; coxæ anticæ inter se latissime remotæ; pedes modici, anticis quam ceteri longioribus; tarsorum anticorum articulus basalis quam ceteri conjuncti parum (posteriorum multo) brevior, 3° in 2° inserto; unguiculi subtus dente parvo armati; metasternum breve; pygidium manifestum, subquadratum.

According to M. Lacordaire's classification the small insect for which I found this genus is a member of the "Anthribides vrais," by virtue of the following characters in combination:—Antennæ inserted on the sides of the rostrum, carina of pronotum basal, rostrum of subparallel form, body not elongate-cylindric. In that group it is distinguishable by the following characters:—Front coxæ very widely separated (more widely than in *Phlœobius*), rostrum truncate at its extremity, antennæ and legs extremely like those of *Araeocerus*. The outline of the prothorax and elytra is not unlike that of *Ceutorrhynchus*. I am uncertain as to the sex of the examples before me. The front margin of the eye itself forms the hind wall of the scrobe.

S. planatum, sp. nov. Piceum vix rufescens, antennis (clava excepta) et tarsorum apice testaceis; sat opacum; sparsim

minus perspicue cinereo-pubescens; supra confertim subtilissime (haud multo aliter quam *Araeocerus fasciculatus*, De Geer) subaspere punctulatum; rostro cum capite continuo; prothorace vage inæquali; elytris striatis, in parte suturali conjunctim planatis; pedibus pube cinerea plus minusve perspicue maculatis; antennis prothoracem medium paullo superantibus, clava quam articuli 4us—8us conjuncti vix brevioribus, articulis 9° vix (10° manifeste) transverso 11° obconico quam latiori parum longiori. Long., $1\frac{1}{8}$ l.; lat,, $\frac{4}{9}$ l. (vix).

There are indications on the specimen before me of the whitish hair-like scales on the upper surface having been in places condensed into somewhat conspicuous blotches which are chiefly about the middle of the front of the prothorax, on the scutellum and about the sides of the prothorax and elytra, especially near the shoulders, and it is possible some such markings may have been rubbed off, although the presence of the even thinly distributed pubescence seems inconsistent with the surface being much abraded. A vague depression runs down the middle of the prothorax longitudinally, on either side of which slightly behind the middle is a distinct transverse gibbosity. The fourth interstice of each elytron is more conspicuous than the other interstices, chiefly through the space between the fourth interstices of the two elytra (including the suture) being flattened. Most of the interstices are furnished in some part of their length with unequal feebly raised tubercles. The head and rostrum together form a perfectly even flattened surface without any trace of distinction *inter se*. The insect has much of the structure of *Araeocerus* but with the rostrum and scrobes of a true *Anthribid*.

Victoria.

S. contemptum, sp. nov. Fere ut præcedens (*S. planatum*) coloratum et pubescens sed pedibus dilutioribus et elytris ad apicem rufis; rostro cum capite continuo; prothorace æquali, lateribus mox ante basin manifeste sinuatis, angulis posticis extrorsum manifeste acutis; elytris æqualiter convexis, interstitiis vix perspicue tuberculatis; antennis prothoracis basin attingentibus, clava quam articuli 3us—8us conjuncti vix breviori, articulis 9°—11° elongatis (10° quam 9us et 11us manifeste breviori. Long., $1\frac{1}{8}$ l.; lat., $\frac{4}{9}$ l. (vix).

This species closely resembles the preceding in general appearance, but is certainly distinct. The pronotum is devoid of inequalities and the elytra have no longitudinal flattening on the sutural region, their interstices also being all but devoid of inæqualities. The sides of the prothorax are quite strongly incurved just in front of the base, and the hind angles of that

segment are very distinctly pointed outward, neither of which characters is found in *S. planatum*. The antennæ are considerably longer in *S. contemptum* than in *S. planatum*, their club especially, of which all the joints are at least twice as long as wide. It is not improbable that these antennal differences may indicate that my example of *contemptum* is a male, and that of *planatum* a female, but they are certainly not the sexes of one species. There is scarcely any indication of the pubescence being condensed in patches on the example before me, but I do not attach much importance to this character, as I find that the condensed long scales on the small *Anthribidæ* are very easily rubbed off, and therefore very unreliable for identification of species.

N. Queensland; given to me by Mr. Koebele.

NOTŒCIA (gen. nov. *Anthribidarum*).

Mas. Rostrum transversum, depressum, ad apicem arcuatim emarginatum, ad basin quam caput haud angustius, scrobibus lateralibus foveiformibus apertis; antennæ quam corporis dimidium sublongiores, graciles, clava minus laxe 3-articulatis, articulis basalibus 2 quam sequentes robustioribus (2° longiori), 3° 4° que inter se sat æqualibus, 5°—8° quam 4us sat brevioribus, 9° obconico 8° longitudine æquali, 10° brevi transverso, 11° quam 9us vix longiori; oculi magni, sat subtiliter granulati, antice sat profunde emarginati, supra inter se approximati; prothorax transversus æqualis, carina antebasali nulla, carina basali ad latera angulata et antrorsum ultra prothoracis medium producta; scutellum parvum; elytra subcylindrica brevia (quam conjunctim latiora circiter ut 10 ad 7 longiora), ad basin leviter gibbosa, striata, postice verticalia; coxæ anticæ subcontiguæ; pedes modici; tarsi antici quam tibiæ haud breviores, articulo basali quam ceteri conjuncti sublongiori; unguiculi subtus dente parvo armati; pygidium manifestum; corpus pubescens.

The insect for which I propose this generic name falls into M. Lacoradire's group "*Anthribides vrais*" by virtue of the following characters:—Antennæ inserted on the sides of the rostrum, carina of pronotum basal, rostrum parallel-sided, body not elongate. The genus, however, can hardly be placed in M. Lacordaire's tabulation of the genera of that group as its two main divisions are "front coxæ widely separated, rostrum strongly emarginate in front," and "front coxæ subcontiguous, rostrum not or scarcely emarginate in front," whereas in this genus the front coxæ are subcontiguous and the rostrum is quite strongly emarginate in front. Its most striking characters are found in its very large eyes, strongly emarginate in front, and

separated from each other on the forehead by a space only about one-third of the width of the rostrum, and its open scrobes which cut the upper surface of the rostrum sufficiently to be both visible when viewed from above. This form of scrobes is an approach to their form in the *Aræocerides*, in which, however, both scrobes are *entirely* visible when viewed from above, and the interval between them is less than the interval between the eyes, whereas in this genus (and others with the scrobes visible and lateral) the interval between them is greater than that between the eyes and only a small part of both scrobes can be seen together.

N. reticulata, sp. nov. Piceo-rufa, pube albida variegata; hac in rostro vage, in capite medio longitudinaliter (et circa oculos) lineatim, in prothorace vage, in scutello confertim, in elytris reticulatim et maculatim, in pygidio ita ut annulos 2 format, in sternis abdominis lateribus pedibusque (in his interrupte) sat dense, disposita; antennarum clava et pedum nonnullis partibus obscuris; corpore toto (pube haud abrasa) confertim subtilissime subaspere punctulato; prothorace fortiter transverso, antice minus fortiter angustato, lateribus parum arcuatis; elytris indistincte (latera versus magis perspicue) striatis, striis vix perspicue punctulatis. Long., $1\frac{3}{4}$ l.; lat., $\frac{7}{10}$ l.

On this pretty little species fine dense red-brown very short pubescence covers the upper surface so closely that there is little apparent sculpture; but, no doubt, if the pubescence were removed underlying sculpture would appear. On the red-brown derm-pubescence there is variegation formed by longer pubescence of ashy-white colour. This longer pubescence is vaguely scattered over the rostrum and pronotum and densely clothes the small scutellum; on the head it forms fine lines and on the elytra it runs in fine sinous longitudinal lines, which are here and there transversely connected,—some of the transverse connections (especially between the third and fourth longitudinal lines) being dilated into conspicuous blotches. The derm-pubescence is more red than brown on the head and becomes gradually less red and more brown hindward. The inequalities of the elytral surface (which are likely to be a generic character) are feebly defined, and best observed by looking at the insect from the side when there is seen to be feeble gibbosity near the base with irregular depression behind the gibbosity, then a scarcely elevated longitudinal ridge on the third interstice slightly behind its middle and a still slighter elevation a little nearer the base on the subsutural interstice while between the ridge on the third interstice and the lateral margin the surface is scarcely visibly depressed.

N. Queensland; sent to me by the late Mr. Cowley.

MISTHOSIMA.

The species described below may be referred I think to this genus which was founded by Mr. Pascoe to include two insects from Borneo. It agrees very well with the characters attributed to the genus by its author and if not a true congener of the already described species must represent a closely allied new genus distinguishable by characters not mentioned in the diagnosis. The only discrepancies are slight, consisting in the second antennal joint being scarcely shorter than the basal one and the metasternum not quite so short as in *Aræocerus* (as, according to description, it should be) but these alone scarcely justify the formation of a new genus.

M. dorsonotata, sp. nov. Oblonga; picea, antennarum basi labro femoribus tibiisque testaceis; pube densa fusca vestita, hac pube cinerea concinne maculatim variegata; antennarum articulo 2° quam 1us vix breviori; supra confertim aspere subtiliter (in elytris quam alibi paullo minus subtiliter) punctulata; elytris subtilissime striatis; pube in corpore subtus quam in corpore supra magis cinerea. Long., $1\frac{3}{4}$ l.; lat., $\frac{3}{8}$ l.

The ashy or whitish pubescence of the upper surface is distributed as follows:—On the head it predominates (the fuscous colour forming two longitudinal lines dilated in front and behind); on the prothorax it is most conspicuous on the sides and middle line; on the elytra it forms numerous small clearly defined evenly distributed spots, three somewhat larger placed transversely across the base, and a common much larger triangular patch (its apex pointing forward) about the middle of the suture.

North Queensland.

DOTICUS.

This genus is unsatisfactorily close to *Aræocerus*. Its author (Mr. Pascoe) says that it differs from *Aræocerus* by the greater length of its front legs, the greater width of its tarsi and the deeper insertion of the third tarsal joint in the second. To this it may be added that (so far as my experience goes) the species with the legs of *Doticus* are considerably larger than any with the legs of *Aræocerus*. Nevertheless I am of opinion that the generic distinction of the two cannot be maintained. I have before me a specimen which is certainly I think *D. palmaris*, Pasc. *Metadoticus*, Olliff, seems to be quite indistinguishable from *Doticus*. The name used by Olliff seems to have been suggested by the author of *Doticus*, and yet there is nothing in his diagnosis to distinguish it from that of *Doticus*, nor does he mention *Doticus*, but compares *Metadoticus* to *Ethneca*, with which *Doticus* has so little connection that it would be hard to find two

Anthribidæ much less allied to each other than they are. Olliff's species (the too common *Metadoticus pestilens*) is quite unmistakable and the insect generally called by that name agrees so perfectly with Olliff's somewhat full specific description that it seems impossible we can be mistaken in our identification of *M. pestilens*. I can find no generic distinction between *M. pestilens* and the insect mentioned above as *D. palmaris*.

D. æqualipennis, sp. nov. Late ovalis; piceus, pube brunnea maculatim vestitus; supra confertim subtilissime subaspere punctulatus; prothorace minus fortiter transverso, antrorsum a basi arcuatim fortiter angustato, æquali; elytris æqualibus, striatis, striis sat fortiter nec crebre punctulatis, interstitiis planis. Long., 3½ l.; lat., 1⅗ l.

The head is entirely covered with bright brown pubescence except a longitudinal vitta of dark brown pubescence on either side of the middle; the pronotum is confusedly variegated with bright brown pubescence on the piceous derm; on the elytra the piceous derm is variegated by bright brown pubescence arranged longitudinally on the interstices, the pubescence being continuous (on the specimen before me, which is evidently not at all abraded) on the front one fifth part of most of the inner seven interstices and nearly so on about the hinder half of the inner five interstices, but on the rest of the interstitial surface it takes the form of small square spots; where the pubescence is not of bright brown colour it is scarcely less dense, but is of the colour of the derm; that of the under surface is uniformly of a pale ashy colour. This species seems to agree absolutely with *D. palmaris*, Pasc., and *M. pestilens*, Oll., in its structural characters. It is very distinct from both, as a species, owing to the even surface of its pronotum and elytra.

Queensland; sent to me by Mr. G. Masters as No. 77.

ARÆOCERUS.

This genus is somewhat numerously represented in Australia, although no species of it have yet been recorded in Australia in such fashion as to be capable of confident identification. In 1835 Boisduval published a diagnosis consisting of nine words of *Anthribus sambucinus*, which he thought might be a variety of *Anthribus coffeæ*, Fab., and the latter (according to Lacordaire) is identical with *Aræocerus fasciculatus*, De Geer. Doubtless therefore *A. sambucinus* is an *Aræocerus* and it now stands in our Catalogues as a variety of *A. fasciculatus*. I have not access to De Geer's description of *A. fasciculatus*, but I know the insect as a Hawaiian *Aræocerus* that the eminent Coleopterist Dr. Sharp named for me. I have examples from tropical Queensland of an *Aræocerus* that I cannot separate

from *fasciculatus*, but I do not think it likely to be *sambucinus*, Boisd., as the habitat of the latter is presumably the neighbourhood of Sydney, where I have taken an *Araeocerus* perfectly distinct from (though closely resembling superficially) *fasciculatus*, and which I have little doubt is the true *sambucinus*.

The species of this genus are very difficult to deal with on account of their pubescence being extremely easily rubbed off, —so that it is necessary to rely almost entirely on structural characters for identification and the descriptions of markings can be but little trusted for identifying any but very fresh specimens,—and also from the absence (alluded to by M. Lacordaire) of any readily available character for determining the sex of a specimen. In studying a considerable number of examples of *Araeocerus* from widely separated parts of Australia I find, owing to the difficulties mentioned, a certain number of forms which I believe to represent additional species, but which I hesitate to treat as certainly distinct, and in the following pages I have limited myself to the well-marked species.

The characters of some of the *Araeoceri* described below do not altogether agree with Lacordaire's diagnosis of the genus, but I am satisfied that the characters in question are not truly generic.

The following tabulation will assist in the determination of the *Araeoceri* known to me as Australian.

A. Each elytron having a well developed basal crest	*bicristatus*, Blackb.
AA. Elytra even at the base,—or nearly so.	
B. Ninth joint of antennæ not or scarcely longer than tenth.	
C. Legs dark...	*Koebelei*, Blackb.
CC. Legs of pale colour	*fasciculatus*, DeG.
BB. Ninth joint of antennæ notably longer than tenth.	
C. Antennæ long enough to reach the base of the prothorax.	
D. Antennal club moderately robust (about as much so as in *D pestilens*, Olliff) ...	*sambucinus*, Boisd.
DD. Antennal club notably more slender ...	*lindensis*, Blackb.
CC. Antennæ not long enough to reach base of prothorax	*asperulus*, Blackb.

A. bicristatus, sp. nov. Ovalis, minus latus; sat convexus; picea, pube læte brunnea dense vestita, hac pube cinerea et nigricanti variegata (hac in pronoto ad latera et medium et in elytris maculatim, illa in elytris sparsissime maculatim, dispositis); antennis prothoracis basin attingentibus, testaceis, clava fusca, articulo 9° quam 10us vix longiori; prothorace minus fortiter transverso, antice fortiter angustato, lateribus leviter arcuatis, basi bisinuata, supra crebre aspere punctulato, angulis posticis acutis; elytris crebre aspere

(quam pronotum vix magis subtiliter) punctulatis, striatis striis puncturis sat magnis leviter impressis, interstitiis tuberculis seriatim instructis, his vix elevatis nisi in interstitio 3° in quo tuberculus anticus cristam longitudinalem bene elevatam format (fere ut *Dotici pestilentis* Olliff sed minus elevatam); femoribus ad apicem haud ut dens productis; tarsis sat fortiter (fere ut *A. fasciculati*, De Geer) elongatis.

Maris tibiis anticis intus ciliatis; tarsis anticis quam feminæ multo robustioribus, et setulis elongatis vestitis. Long., 1—1$\frac{3}{5}$ l.; lat., $\frac{2}{5}$—$\frac{3}{5}$ l.

Readily distinguishable among the Australian *Aræoceri* by the crest-like tubercle near the base of the third interstice of its elytra. In a fresh specimen the alternate elytral interstices bear a number of rather conspicuous little tubercles covered with pubescence (on some of the tubercles darker, on others lighter, than that of the general surface) which is a little longer than of the general surface, while the basal margin of the elytra is entirely and narrowly bordered with red-brown pubescence. In abraded specimens the interstitial tubercles are much less conspicuous. Compared with *Doticus palmaris*, Pasc., and *pestilens*, Olliff, the present species is, *inter alia*, very much smaller and narrower.

Queensland; given to me by Mr. Koebele.

A. Koebelei, sp. nov. Sat late ovalis; sat convexus; nigricans, prothorace antice et postice et pedibus plus minusve rufescentibus, antennis (clava excepta) rufis; pube albo- vel rufo-cinerea in pronoti parte anteriori et in elytrorum partibus scutellari humeralique et interstitiis alternis maculatim vestitus; antennis prothoracis basin attingentibus, articulo 9° quam 10us vix longiori; prothorace fere ut *A. bicristati* sed magis transverso; elytris fere ut *A. bicristati*, sed interstitio 3° basin versus haud gibboso; femoribus ut *A. bicristati*; tarsis quam *A. bicristati* magis robustis, minus elongatis. Long., 1$\frac{1}{2}$—2 l.; lat. $\frac{3}{5}$—1 l.

Maris tibiis anticis leviter sinuatis, intus ciliatis et subtiliter crenulatis; tarsis anticis breviter pilosis et leviter dilatatis.

Readily distinguishable from its Australian congeners known to me by its almost black colour, and its dark legs. It is a much broader and more robust species than *A. bicristatus*. In a fresh specimen the whitish pubescent spots stand out very conspicuously on the blackish general surface. They form a slight mottling on the head, and front and base of the pronotum, an elongate patch including the scutellum, a patch (of somewhat reddish tone) on each shoulder, and a number of smal spots on the alternate inter-

stices of the elytra. I have two examples sent to me by Mr. Masters which may possibly represent a closely allied distinct species, as they are of even broader and more robust form than the type, with the pale spots on the elytra evidently (though only slightly) raised, but their colours and markings agree so exactly with those of the type that I am disposed to think them merely fine and highly developed examples of the one species.

Queensland; given to me by Mr. Koebele.

A. lindensis, sp. nov. Mas. Brevis; latus; sat convexus; rufo-brunneus, sternis et antennarum clava piceis; pube cinerea in partibus vestitus sicut partes haud pubescentes ut notulæ obscuræ apparent (harum præsertim manifesta est in elytris notula magna basalis subsuturalis,—in exemplis nonnullis cum alterius elytri notula conjuncta); antennis prothoracis basin vix attingentibus, articulo 9° quam 10us sesquilongiori, clava sat gracili; prothorace sat transverso, confertim subtilius granulato-punctulato, antice angustato, lateribus modice arcuatis, angulis posticis (superne visis) sat rectis; elytris striato-punctulatis, interstitiis confertim aspere punctulatis; femoribus subtus (anticorum parte media acute trispinosa) mox ante apicem profunde emarginato, apice ipso deorsum (ut dens parvus) acuto; tibiis anticis intus subtiliter manifeste crenulatis; tarsorum anticorum articulo basali sat breve setulis elongatis vestito; coxis anticis inter se anguste separatis. Long., 1—1$\frac{1}{5}$ l.; lat., $\frac{1}{2}$—$\frac{3}{5}$ l.

This species is at once separable from the preceding two (*bicristatus* and *Koebelei*) and from *fasciculatus*, De G., by the peculiar structure of the front femora of its male. The markings (resulting from the presence of spaces on which the ashy pubescence is wanting) form a vague mottling on the prothorax and elytra, of which the most conspicuous feature is a rather large basal elytral spot close to the scutellum on either side (the two spots united in some examples). This basal elytral spot appears very dark and well defined when the insect is looked at obliquely from in front, but is much less noticeable when looked at from behind. The other parts of the elytra devoid of ashy pubescence appear as small spots running into indistinct oblique fasciæ,—in some examples their fascia-like disposition scarcely discernible.

Although I have taken about seven specimens of this insect, they are all males.

S. Australia (Eyre's Peninsula).

A. sambucinus, Boisd. Præcedenti (*A. lindensi*) affinis; minus brevis; antennarum clava magis robusta; elytris ad basin haud vel vix perspicue plaga obscura notatis; tarsorum anticorum articulo basali sat majori.

Maris femoribus tibiisque anticis fere ut *A. lindensis*, sed spinis (in illius parte media subtus positis) multo brevioribus vel granuli formibus; tarsorum anticorum articulo basali paullo magis robusto et setulis elongatis vestito.

Feminæ femoribus anticis ad apicem vix deorsum productis, tibiis intus haud crenulatis, tarsis haud setulis elongatis vestitis. Long., $1\frac{1}{2}$—$1\frac{3}{5}$ l.; lat., $\frac{7}{10}$ l.

Distinctly larger than *A. lindensis* and without (or almost without) any indication of the dark blotches at the base of the elytra. Differs from the male of *lindensis* (and no doubt from the female also) by the much less slender club of its antennæ and the notably larger basal joint of its front tarsi. The male differs from the male of *A. lindensis* by the sexual ante-apical emargination and apical tooth of its femora being present only in the front pair and by the very much feebler inequalities on the middle part of the undersurface of its front femora. Differs from *fasciculatus*, De G. *inter alia* by its sexual characters.

Widely distributed in Southern Australia.

A. asperulus, sp. nov. Ovalis; minus latus; sat convexus; piceus, pronoto antice elytris tibiisque dilutioribus, antennis (clava excepta) rufis; pube cinerea sparsim (exemplorum visorum haud maculatim) vestitus; antennis prothoracem medium parum superantibus, articulo 9° quam 10us sesquilongiori; prothorace sat fortiter transverso, ante basin anguste transversim depresso, in ceteris partibus æquali nullo modo canaliculato, confertim minus subtiliter aspere punctulato, angulis posticis extrorsum manifeste prominulis; elytris striatis, striis cancellato-punctulatis, interstitiis aspere subfortiter crebre punctulatis; femoribus mox ante apicem subtus profunde emarginato, apice ipso deorsum (ut dens parvus) acuto; tarsis quam *A. fasciculati*, De Geer, sat brevioribus sat robustioribus; coxis anticis inter se sat late separatis. Long., $1\frac{1}{2}$ l.; lat., $\frac{7}{10}$ l. (vix.).

I am not sure that a new genus ought not to be formed for this insect on account of its short antennæ, comparatively widely separated front coxæ, and curiously shaped femora, but as in the preceding two species the first of the above characters is approached and the last is even exaggerated, I think they may be regarded as a gradual divergence from the typical characters of *Aræocerus* rather than the indication of a really distinct genus. The present species owing to its elongate oval form and pubescence not condensed into spots (I do not think the two specimens before me are abraded) has scarcely the facies of *Aræocerus*, but the preceding two species (which are undoubtedly allied to it) have quite the facies of *Aræocerus*. The insertion of

the antennæ is altogether as in a typical *Aræocerus* in being slightly nearer to the middle line of the head and rostrum than is the inner margin of the eye. The specimens before me are females. Their antennal club is short and moderately stout.

S. Australia; Eyre's Peninsula.

ARÆOCERODES (gen. nov. *Anthribidarum*).

Caput transversum; rostrum transversum, supra sat planum, ad apicem truncatum, ad basin quam caput haud angustius, scrobibus ut *Aræoceri*; antennæ prothoracis basin paullo superantes, sat graciles, articulis basalibus 2 quam ceteri robustioribus (2° longiori), 8° ad apicem leviter dilatato, 9°—11° clavam elongatam laxe articulatam formantibus; oculi oblongo-ovales haud (vel vix) emarginati, grossissime granulati; prothorax transversus, æqualis, antice modice angustatus, carina antebasali nulla; carina basalis ad latera angulata et antrorsum brevissime producta; scutellum angustum; elytra convexa, æqualia, striata, striis fortiter nec crebre punctulatis; coxæ anticæ sat contiguæ; pedes modici, anticis quam ceteri longioribus; tarsi modici, articulo 3° in 2° profunde inserto; unguiculi subtus dentati.

Structurally near to *Aræocerus*, but of evidently more cylindric form and with narrow, elongate, very coarsely granulated eyes. The species is the smallest *Anthribid* that I have seen.

A. lilliputanus, sp. nov. Pallide testaceus, antennarum clava obscura; pube albido-testacea vestitus, hac in elytris trifasciatim disposita; capite prothoraceque confertim subfortiter granulatis; prothoracis angulis posticis (superne visis) retrorsum acutis. Long., $\frac{2}{3}$ l. (vix); lat., $\frac{3}{10}$ l.

The characters not mentioned in the above specific description are fully stated in the generic diagnosis and need not be repeated. Its excessively minute size will at once distinguish this insect from all the previously described Australian *Anthribidæ*.

N. Queensland; sent to me by the late Mr. Cowley.

PHYTOPHAGA.

CLEPTOR.

I have before me examples of both species of this genus, named by Mr. Jacoby and agreeing so well with Lefèvre's descriptions that I can feel no doubt of their identity. But I think the genus is not rightly placed next to *Edusa* as it seems to me very much closer to *Colaspoides*, of which it entirely reproduces the prosternal characters. M. Lefèvre indeed characterises the *Edusitæ inter alia* by the phrase "prosternum oblongum" and yet places *Cleptor* in that group in spite of his diagnosis of its

prosternum as being "latius quam longum." I can really find no very marked character to distinguish *Cleptor* from *Colaspoides* except in its eyes being almost without sinuation. M. Lacordaire distinguished the "*Edusites*" from the "*Endocephalites*" (containing *Colaspoides*) by the presence in the former of transverse elytral rugosities, but this distinction is not reliable. M. Lefèvre mentions the rugosities as only "generally" present in the former group, M. Lacordaire himself admits that in some *Edusites* "elles peuvent passer inapperçues," and I possess species of *Colaspoides* in which they are not quite wanting. The groups then (as characterised by M. Lacordaire) cannot be maintained; nor does M. Lefèvre, though accepting the groups, suggest any better distinction. Whether it would be practicable and desirable to regard *Edusa* and *Colaspoides* as the typical genera of two groups (which would have very different contents from those mentioned above) distinguished from each other by the form of the prosternum I must leave to the decision of authors better equipped than I am for studying a large cosmopolitan collection of *Eumolpides*, but however the genera should be grouped I am convinced that *Cleptor* ought to stand close to *Colaspoides*. Along with the examples of *Cleptor* mentioned above Mr. Jacoby sent me a specimen as *Colaspoides xanthopus*, Har., which appears to be correctly named, but is certainly, I think, a *Cleptor*. It is identical with a specimen I received from the Chapuis' collection ticketed "*Neotaxis fulgida*." I cannot find that Dr. Chapuis ever published such a genus and species. Possibly the genus *Cleptor* was published at such time as to forestal *Neotaxis*,—but at any rate it indicates that Dr. Chapuis did not place Harold's insect in *Colaspoides*.

The following is a new species of *Cleptor*.

C. Haroldi, sp. nov. Glaber, supra cyanescens viridi-micans, subtus niger (certo adspectu aureo-vel cupreo micans), antennis ferrugineis apicem versus obscurioribus, pedibus piceis plus minusve rufescentibus; pronoto crebre subtilius punctulato, puncturis singulis oblongis; scutello lævi; elytris in disco medio crebre fortiter (in ceteris partibus minus crebre minus fortiter) vix seriatim punctulatis, pone basin vix manifeste impressis, pone humeros certo adspectu transversim leviter rugatis. Long., $2\frac{1}{2}$ l.; lat., $1\frac{3}{5}$ l.

Compared with *C. rufimanus*, Lef., the pronotum is considerably more closely punctulate, with the lateral puncturation much more evidently offering a longitudinally rugate appearance, while the puncturation of the elytra is much finer near the lateral margins; the form also is notably less convex. Compared with *C. inermis*, Lef., and *xanthopus*, Har., *inter alia multa* there is scarcely any indication of a transverse impression near the base of the elytra.

N. Queensland.

NEOCLES.

N. innocuus, sp. nov. Minus elongatus; piceus plus minusve metallico-micans, capite antennis palpis femoribus tibiis tarsisque rufis; pube aureo-brunnea (hac nonnihil maculatim disposita) vestitus; capite sat profunde ruguloso; prothorace quam longiori vix latiori, antrorsum leviter angustato (nihilominus, superne viso, fortiter angustatus apparet), antice valde producto, fortiter granulo so-ruguloso, longitudinaliter leviter late sulcato, lateribus minus arcuatis, angulis anticis sat rectis posticis obtusis; elytris subseriatim confertim punctulatis et granulatis, nullo modo costatis. Long., $3\frac{1}{2}$ l.; lat., $1\frac{3}{8}$ l.

This genus is remarkable among the *Eumolpides* by the presence of prosternal channels for the reception of the antennæ, and by a facies very unlike that of a typical *Eumolpid*. Only one species has been described hitherto—*N. sulcicollis*, Chp., of which I possess the type. Owing to the front margin of the pronotum being very strongly produced forward in the middle the prothorax appears (when viewed from above) to be very much more narrowed in front than it really is, and owing to the extero-anterior angles of the prosternum being strongly produced the pronotum (viewed in a somewhat oblique direction which discloses the prosternal angles) appears to have spiniform front angles. The present species differs from *N. sulcicollis* by, *inter alia*, its non-costate elytra, and the sides of its prothorax (though slightly serrate, yet) without a defined median angular projection.

N.S. Wales; Tweed R. district.

CASSIDIDÆ.

CASSIDA.

C. profunde-striata, Spaeth. The description of this insect (Verh. Ges. Wien., 1899, p. 216) reads as if it might well be founded on a specimen of *C. mera*, Germ., which varies from the type in having its elytra more or less spotted with black. I have taken in company specimens with and without dark spots. Herr Spaeth does not mention *C. mera*, to which his insect is at any rate extremely close.

ABSTRACT OF PROCEEDINGS

OF THE

Royal Society of South Australia

FOR 1899-1900.

ORDINARY MEETING, NOVEMBER 7, 1899.

W. L. CLELAND, M.B. (President) in the chair.

EXHIBITS.—J. G. O. TEPPER, F.L.S. exhibited a ferruginous sandstone of peculiar form, and some calcareous travertine, the latter showing remarkable weathering; both specimens from the Lake Eyre distict. MR. S. DIXON some specimens from Mount Morgan mine, and described the conditions under which they were found. Also he gave a description of the labour-saving machinery by which 20,000 tons of ore were treated on the mine per month, and referred to the liberal and enlightened policy pursued by the directors by which they were enabled to attract the best available talent to their service. He also showed some rich tin ore specimens from North Queensland, and a water bag made by the natives of Queensland from the bark of a tree not identified. MR. TEPPER drew attention to botanical experiments by Von Herzule in 1875, and by W. H. Preuss more recently, which tended to prove that plants must manufacture their own mineral matter.

PAPER.—"Notes on the Cliffs Separating Aldinga and Myponga Bays," by EDWARD VINCENT CLARK, B.Sc.

ORDINARY MEETING, DECEMBER 5, 1899.

W. L. CLELAND, M.B. (President) in the chair.

EXHIBITS.—J. G. O. TEPPER, F.L.S., exhibited a beryl lying in a matrix of quartz from near Williamstown. A piece of chalcedony with dentritic markings, and a small spherical body of low specific gravity and well defined marking which was picked up near the sea at Bunbury, W.A. A. PURDIE, M.A., showed specimens of fossiliferous cal-

careous rock from the vicinity of Cape Jervis from a raised beach above the Till, and mentioned that Second Valley was well worthy a visit, being evidently grooved out of the glacial till, and exhibiting many travelled boulders.

PAPERS.—"Descriptions of new Micro-lepidoptera," by DR. JEFFERIS TURNER. "A Refutation of the Doctrine of Homotaxis," by PROF. RALPH TATE, F.G.S. (Withdrawn.)

ORDINARY MEETING, APRIL 3, 1900.

W. L. CLELAND, M.B. (President) in the chair.

EXHIBITS.—MR. GITTINS showed the fruit of a Japanese climbing plant which Mr. J. G. O. Tepper subsequently discovered was that of Akebia quinata, belonging to the order Berberideæ, and a native of China and Japan. MR. TEPPER exhibited some galls from the wattle, Acacia pycnantha, describing the insect which produced them. He also showed a case of mosquitoes, Anopheles, which had been collected by order of the Government to forward to London for the School of Tropical Medicine to examine malarial germs, &c., and made some interesting remarks on this troublesome insect.

PAPERS.—"A Collection of Birds' Skins from Kalgoorlie, W.A.," by ROBERT HALL. "Further Notes on Australian Coleoptera, &c.," by REV. THOMAS BLACKBURN, B.A.

ORDINARY MEETING, MAY 1, 1900.

W. L. CLELAND, M.B. (President) in the chair.

EXHIBITS.—PRESIDENT, referring to minutes of last meeting, stated that it had been noticed that in two districts, widely separated—one in Africa, the other in Indo-China—mosquitoes did not exist, and malarial fever was there unknown. W. HOWCHIN, F.G.S., exhibited graphic granite and felspar from Winulta Creek, and from near Corny Point, Yorke Peninsula, and showed some felspar which the natives had endeavoured to shape for their weapons, but had found very difficult to point owing to the cleavage and hackly fracture of it. He also exhibited specimens of the matrix in which diamonds were found from the De Beer's mine, South Africa. A. ZEITZ, F.L.S., Assistant Director of the Museum, exhibited 20 species of abnormally coloured birds collected in South Australia. J. G. O. TEPPER, F.L.S., exhibited a piece of wattle tree stem completely riddled by the larvæ of (*Agrilus Australasiæ*) beetles which are so destructive in wattle plantations. Also a rare fungus, *Battarrea* sp.? forwarded from Dalkey by MISS WARE.

PAPER.—"A Tentative Hypothesis of the Nature of Heat as a Form of Energy," by J. G. O. TEPPER, F.L.S.

ORDINARY MEETING, JUNE 5, 1900.

W. L. CLELAND, M.B. (President) in the chair.

PROFESSOR RALPH TATE moved, MR. HOWCHIN seconded—"That the congratulations of this Society be accorded to Joseph Vardon, one of the oldest Fellows of the Society, upon his election as member of the Legislative Council for the Central District of the colony."—Carried by acclamation.

EXHIBITS.—J. G. O. TEPPER, F.L.S., a piece of leather made from hide destroyed by Queensland tick. E. ASHBY, several moths collected by himself; one of which was identified by Mr. Tepper as *Lithosia*. W. HOWCHIN, F.G.S., in connection with his paper on glacial action in Southern Yorke Peninsula, specimens of ice-marked stones. One was an ice-polished granite boulder from a well at Yorktown found in clay 60 ft. down.

PAPERS.—"Evidences of Extinct Glacial Action on Southern Yorke Peninsula," by WALTER HOWCHIN, F.G.S. "Supplementary List of Plants from Mount Lyndhurst Run," by MAX KOCH.

ORDINARY MEETING, JULY 3, 1900.

W. L. CLELAND, M.B. (President) in the chair.

PAPER.—"The Physical Features of Lake Callabonna, with an Account of the Discovery of its Fossil Remains," by PROFESSOR E. C. STIRLING, M.D., F.R.S. (Published in "Memoirs," vol. I., part 2).

ORDINARY MEETING, SEPTEMBER 4, 1900.

W. L. CLELAND, M.B. (President) in the chair.

EXHIBITS.—A. ZEITZ, F.L.S., C.M.Z.S., exhibited two species of crustaceans, *Limnosia* sp.? and *Chelura* sp.? which he discovered boring in the piles of Largs Bay Jetty and destroying the outer surface, whilst the *Teredo* riddles the interior. J. G. O. TEPPER F.L.S., showed a lime fruit affected by a new disease not described by McAlpine in his "Diseases of Citrus Trees." W. H. SELWAY showed some rare wild flowers gathered from the foot of hills some two miles west of Golden Grove; also an orchid Caladenia? from Monarto.

PAPERS.—(1) "On the Discovery of Fossiliferous Rocks in High Southern Latitudes." (2) "Section of a Well Bore near Wellington," by PROF. RALPH TATE, F.G.S.

"The Complete Theory of Changing the order of Integration in a Multiple Integral (part 1)", by RICHARD KLEEMAN. (Withdrawn.)

"Definitions of two new Species of South Australian Polyplacophoræ," by EDWIN ASHBY.

"Definition of a new Species of South Australian Polyplacophora," by M. M. MAUGHAN.

ANNUAL MEETING, OCTOBER 2, 1900.

W. L. CLELAND, M.B. (President) in the chair.

EXHIBITS.—W. L. CLELAND, M.B., exhibited photographs of aborigines from various parts of Australia with a view of illustrating their uniformity of type.

ANNUAL REPORT AND BALANCE-SHEET were read and adopted.

ELECTION OF COUNCIL.—President, Prof. Edward H. Rennie, M.A., D.Sc., Lond.; Vice-Presidents, Walter Howchin, F.G.S., W. L. Cleland, M.B.; Honorary Treasurer, Walter Rutt, C.E.; Honorary Secretary, G. G. Mayo, C.E.; Members of Council, Rev. Thomas Blackburn, B.A., Prof. Ralph Tate, F.G.S., Samuel Dixon, W. H. Selway, E. Ashby, and A. M. Morgan, M.B., Ch.B.; Auditor, J. S. Lloyd.

PAPERS.—"New Australian Mollusca," by PROF. RALPH TATE, F.G.S., and W. L. May. "Further Descriptions of Australian Coleoptera," by REV. THOMAS BLACKBURN, B.A.

The newly-elected President, Prof. E. H. Rennie, then took the chair, and the Presidential Address, "Factors Producing Uniformity of Type amongst Australian Aborigines," was read by the retiring President, W. L. Cleland, M.B.

REV. THOMAS BLACKBURN moved, MR. A. ZEITZ seconded—"That the above address be printed in the Society's Transactions."—Carried.

ANNUAL REPORT.

The Council has to report that during the past year an effort has been made to create a greater interest in independent research, as promoted by this Society, by encouraging science students of the University and the School of Mines to attend the ordinary monthly meetings, and also by giving more publicity to them by advertising in the daily press. These efforts have not been without success, but the membership remains almost stationary.

The membership of the Society consists of 11 Hon. Fellows, 68 Fellows, and 6 Corresponding Members.

The second part of the "Memoirs," vol. I., dealing with the Fossil Remains of *Genyornis newtoni*, from Lake Callabonna, the joint production of Prof. E. C. Stirling, M.D., F.R.S., &c., Director, and A. H. C. Zietz, F.L.S., C.M.Z.S., Assistant-Director, of the Adelaide Museum; and the Physical Features of the Lake, by the first-named scientist, has been issued. There seems to be some outside interest in this work already, and, doubtless, when it becomes better known it will find a very prominent place amongst the scientific public. Mr. Walter Howchin, F.G.S., has extended his researches on Past Glacial Action in Southern Yorke Peninsula, where he has made some interesting and valuable discoveries; while Prof. Ralph Tate, F.G.S., has brought under the notice of this Society the unique discovery of fossil remains in high Southern latitudes.

A card catalogue of the Society's books and scientific serial literature is now being prepared, which it is hoped will at once make these valuable works more accessible to the Fellows and Members.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Dr.	£	s.	d.	£	s.	d.
Oct. 1, 1899.						
To Balance				105	6	0
" Subscriptions—						
Royal Society	60	7	9			
Field Naturalists' Section ...	17	0	0			
Astronomical Section	18	12	6			
				96	0	3
" Donations				0	10	0
" Government Grants—						
Ordinary	76	13	0			
Illustrating Fossil Fauna of S. Australia	100	0	0			
				176	13	0
" Interest				4	7	9
				£382	17	0

Cr.	£	s.	d.	£	s.	d.
By Cost of Transactions—						
Printing	100	9	0			
Illustrating...	25	3	3			
Publishing	11	5	6			
				136	17	9
" Cost of Memoirs—						
Printing	38	5	0			
Illustrating...	35	10	6			
Publishing	7	7	6			
				81	3	0
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" Advertising				0	9	0
" Exchange on Cheques				0	3	0
" Balance in Savings Bank, Oct. 1, 1900				143	2	0
				£382	17	0

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PRESIDENTIAL ADDRESS.

FACTORS PRODUCING UNIFORMITY OF TYPE AMONGST AUSTRALIAN ABORIGINES.

BY W. L. CLELAND, M.B.

(Read October 2, 1900.)

In offering a Presidential Address I may congratulate the Society on the production of Part 2 of its "Memoirs" during the year; and also that the Government has again placed on the estimates a further sum of £100 towards the publication of Part 3, descriptive of the Calabonna fossils. It is also pleasing to note that the value of the anthropological work done by Prof. Baldwin Spencer and our fellow colonist, Mr. F. G. Gillen, S.M., has been appreciated by leading scientific men in Great Britain. This has led to a memorial being sent to the South Australian Government and the University of Melbourne, that these two gentlemen might be allowed a further opportunity of studying the aboriginal habits and customs in Central Australia. It is extremely gratifying to know that the authorities have seen their way to granting the request, and that the princely generosity of Mr. David Syme, of the Melbourne *Age*, has supplied the necessary funds.

It may be of interest to the Fellows of the Society if a short space is devoted to the consideration of how there exists such a uniformity of type in the appearance of the aborigines of Australia. To enquire why, considering the Continental dimensions of Australia, practically the same type of features appears in parts separated by hundreds of miles. To enquire why evolution, which is always at work, has not produced greater diversity of type.

It has been pointed out by Romanes, in his work, "Darwin and After Darwin," that evolution rests on a tripod consisting of Variability, Heredity, and Isolation. And that evolution again is monotypic or polytypic according to certain definite conditions. And, further, that there is no evolution at all if free intercrossing is allowed amongst all the members of the parent stock, and if isolation in any of its many forms is not present. For, although there is a tendency to variability in each individual, yet heredity in the event of free intercrossing neutralises this tendency by the

production of the mean of the whole. Under these conditions heredity tends to uniformity of type if the numbers are large. If, however, the parent stock be separated into parts, which are prevented from interbreeding, or a part of whose progeny becomes less fertile or less adapted to altered conditions, then a new factor, namely, isolation, comes into play, and an evolution or evolutions of type appear as a result. The diversities of these results will depend upon the size of the separated parts. For instance, a parent stock divided into two equal parts by isolation will evolve into two different types because the mean of variability of a half is different to that of a whole, but the evolution will be slow, because the differences would be slight between the two, other things being equal. If, on the other hand, the separated part is comparatively small, the divergent evolution would be proportionately marked and appear at an earlier date.

To fully appreciate the effects of isolation, considerable emphasis is laid on the species of isolation as distinguished from the form of isolation, the former being much more important as an evolutionary factor. In other words, is the isolation discriminate or indiscriminate; in the discriminate isolation it is a breeding of like with like; in the indiscriminate it is an interbreeding between all the members of a simply separated part. If a breeder divides his flock of sheep into a white part and a black part, it will be a case of discriminate isolation; if simply into numerically two equal parts it will be a case of indiscriminate isolation. Unfortunately, different names have been given to these two kinds of isolation, although practically the same thing is understood. For instance, discriminate isolation is called by Gulich segregate breeding, by Weissman amixia, and by Romanes homogamy; whilst indiscriminate isolation is called by Gulich separate breeding, by Weissmann panmixia, and by Romanes apogamy. To clearly define what he implies by the use of different terms applied to isolation, Romanes makes the following note:—Let isolation be considered a *generic* term; *species* of isolation will be homogamy and apogamy or isolation as discriminate and indiscriminate, and that natural selection may be considered a *sub-species* of homogamy; *forms* of isolation are modes of isolation, such as the geographical, the sexual, the instinctive, or any other of the numerous means by which isolation of either species may be secured; *cases* of isolation are the instances in which any of the forms of isolation may be at work; thus, if a group of intergenerants be segregated into five groups, *a*, *b*, *c*, *d*, *e*, then before the

segregation there would have been one case of isolation, but after the segregation there would be five such cases.

VARIABILITY.—The most important and fundamental cause of evolution must necessarily be the innate tendency of all organisms to vary one from the other, for a close inspection reveals the fact that no two are exactly alike. It is found again that in different species the range of individual variability varies to a considerable extent; that is, that some species are more stable than others. So that conditions that would cause some collections of individuals to evolve in certain directions may be quite inoperative when applied to others. Romanes quotes as an example of the latter, the goose, which Darwin calls an "inflexible type" as compared with most other domesticated birds. He also refers to some extremely striking examples quoted by Weissmann for the sake of showing that there are cases which seem to tell against the general principle of modification as due to apogamy alone. These examples are four species of butterflies, belonging to three genera, which are identical in the polar regions and in the Alps, notwithstanding that these insects have been presumably separated from the parent stocks since the glacial period; and another example refers to a fresh water crustacean (*apus*), the represenatives of which are habitually compelled to form small isolated colonies in widely separated ponds, and, nevertheless, exhibit no divergence of character, although isolation has probably lasted for centuries. Again, on Mount Kosciusko were found specimens of flora and fauna characteristic of the alpine regions of Tasmania. On the other hand, the land mollusca of Maderia and the Sandwich Islands present diversities of types as numerous almost as the different sites suitable for local isolation. It is evident, therefore, that the existence of this tendency or otherwise to individual variability must play a most important determining influence on evolution. In the human species, where the type is pure, the tendency to variability appears to be small, as may be conveniently seen in the Jewish, Negro, and Fellaheen types. In the case of the Australian aboriginal, whether he is autochthonous or an emigrant, he must have been isolated for a lengthened period from other races of man due to his geographical position. His type is found nowhere else, and he has shown but little tendency to vary that type, so that the presumption is on the side of an autochthonous origin. The absence of a tendency to variability must, therefore, have been an important factor in producing uniformity of type amongst the Australian aborigines.

HEREDITY.—Variability would not be of much use in evolution where it not that physical characteristics can be transmitted from parent to offspring. A tendency to variability will exist in all organisms, although the amount of that tendency will vary within very large limits. Heredity may be either a help or a hindrance to evolution, as has been plainly shown by Romanes. In the case of the Australian aborigines, which has it been? According to the "Law" of Delboeuf, quoted by Romanes, a constant cause of variation, however insignificant it may be, changes the uniformity of type little by little, and diversifies it *ad infinitum*. From the homogeneous, left to itself, only the homogeneous can proceed; but if there be a slight disturbance in the homogeneous, the homogeneity will be invaded at a single point, differentiation will penetrate the whole, and, after a time—it may be an infinite time—the differentiation will have disintegrated it altogether. Has this differentiation which existed amongst Australian aborigines been accentuated or diffused by heredity? Prof. Pearson and his colleagues, writing on "Genetic (Reproductive) Selection" in the *Philosophical Transactions* of the Royal Society of London, vol. 192, in their concluding remarks, make the following statement:—There is, so to speak, in every species an innate tendency to progressive change, quantitatively measureable by determining the correlation co-efficients between fertility and organic characteristics and between fertility in the parents and the offspring. This "innate tendency" is no mysterious force causing evolution to take place in a pre-ordained direction, it is simply a part of the physical organization of the individual which does not leave fertility independent of physique and organic relationship, or leave these characters uncontrolled by the principle of heredity. The suspension of natural selection does not denote either the regression of a race to past types, as the supporters of panmixia suggest, or the permanence of the existing type as others have believed. It really denotes full play to genetic or reproductive selection, which will progressively develop the race in a manner which can be quantitatively predicted when once we know the numerical constants which define the characters of a race and their relation to racial fertility. In other words, natural selection must not be looked upon as moulding an otherwise permanent or stable type; it is occupied with checking, guiding, and otherwise controlling a progressive tendency to change.

Heredity, in the presence of free intercrossing, cancels the tendency to variability, causing fixity of type. A considera-

tion of the marriage laws as described in *Native Tribes of Central Australia*, plainly shows that elaborate precautions, no doubt quite unconsciously, are taken to ensure free intercrossing. Referring to various sexual relations, as occurring at corroborees and other tribal ceremonies, the authors express the opinion that the most feasible explanation is that at one time "promiscuity" was the general and universal rule as regards marital relationships. Amongst gregarious animals "promiscuity" must theoretically be the rule, although in practice one or more of the stronger males will usurp to themselves all the females of the group. Promiscuity in itself is detrimental to the fertilising of the ova of higher developed animals, and, if rigorously carried out, would lead to the extinction of the species. Hence is seen the utility of the emotion of jealousy, which finds its fullest expression in man, and acts beneficially as a selective and restrictive influence. In animals it may also be noted, but in a comparatively primitive form, and the remark of the above authors that it is but little developed and scarcely known amongst the Australian aborigines, throws an interesting sidelight on the primordial character of their mental constitution. Promiscuity being then inimical to the propagation of the species, and the application of the principle "that he takes who can" not finding favor with the cunning old men in the presence of the strong young men, it is found that the former gradually evolved what appears at first sight to be a most elaborate system of marital relationships, any infringement of which is punishable by death. Although the term "free intercrossing" seems inappropriate to such a rigid and exclusive system of marriage relationships, yet an examination of these reveals the fact that they in a most effectual manner ensure all the effects of free intercrossing without the evils of promiscuity. For this purpose the native tribes are each divided into what become eight intermarrying groups, the system being more elaborately differentiated in some than in others. In the first place, four groups were arranged, and these were subsequently subdivided. If these first four are looked upon as a first generation, and the subsequent four as a second generation, the following arrangement of letters will show the relationship of the third generation. It may be mentioned that there are no terms amongst the natives expressive of blood relations as distinguished from group relations. For instance, if a man A marries a woman B, the child will not only call A and B father and mother, but all the A's and B's whom the tribal customs would have allowed to be his father and mother had they been mated.

	Intergenerant Groups.		Offspring Groups.	
1st generation ...	$a + b$	produces	g or f	2nd generation.
	$c + d$	"	e " h	
2nd generation ...	$e + f$	"	c " b	3rd generation.
	$g + h$	"	a " d	
3rd generation ...	$a + b$	"	g " f	4th generation.
	$c + d$	"	e " h	

The significance of the word "or" in the above table is that different group-names are given to the children according as to whether "a" &c., &c., is male or female. The above scheme of marital arrangements shows that the progeny of the four first groups (a, b, c, d), have to cross-marry in the second generation according to the four second groups (e, f, g, h). Their progeny again cross-marry in the third generation, and are called by the same group names as the original four first groups. This complete and systematic intercrossing for three generations causes the principle of heredity to swamp any tendency to divergent or polytypic evolution. Whatever tendency there may have existed to variability would under these conditions have been all in one direction, and have been the mean of the whole, producing a monotypic evolution, because, as Romanes points out, natural selection alone can never produce polytypic, but only monotypic evolution. The marriage laws of the Australian aborigines are seen, therefore, to favor the maintenance of a uniformity of type.

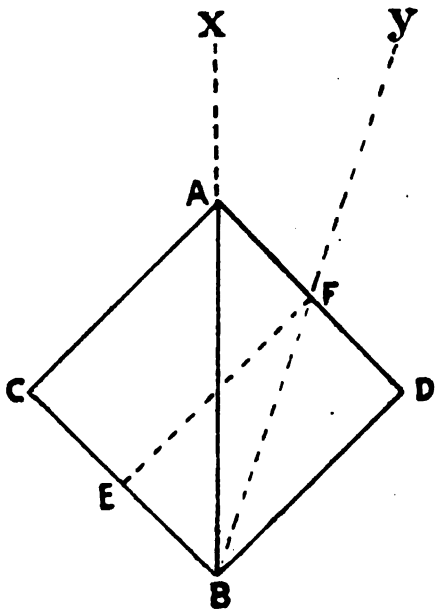
Isolation.—As has been mentioned, isolation is a generic term having species, sub-species, forms, and cases. As a *genus* the isolation of the Australian aboriginal has been a marked one, and, comparatively speaking, a complete one, from the rest of humanity. As a *species* of isolation it may be put under the heading of homogamous or discriminate isolation; that is, the breeding of like with like. There is no evidence of this race having been separated from any parent stock, nor do there exist any traditions pointing to any such past, but everything seems to confirm the idea that they are part and parcel of their environment, or, in other words, autochthonous. The isolation, therefore, has been essentially discriminate. It has been pointed out that that *sub-species* of homogamy called *natural selection*, which is the exclusive breeding between those best adapted to their environment, is ineffective to produce divergence of type unassisted, except in one direction, but that its effects may be cumulative; or, as Pearson writes, it may be occupied with checking, guiding, and otherwise controlling a progressive

tendency to change. Although it is not necessarily maintained that the Australian aboriginal has not changed at all since his first appearance upon the earth, yet the presumption is that if he has changed, he has changed *en bloc*, and very slowly. As to *forms* of isolation, naturally one of the most important is geographical isolation. Australia, as an ethnological province, appears to have been always secluded to a great extent from the rest of the world, so that facilities for the intermingling of other races were but small. In addition to this, Australia, over a very large area, presents a uniformity of physical conditions of an extent scarcely surpassed in any other portion of the earth. Prof. Tate, in a paper read before the Australian Assoc. Advance. of Science in 1888, on the *Influence of Physiographic Changes in the Distribution of Life in Australia*, shows how climatic differences in geological times have profoundly affected the flora and fauna of respective portions of Australia. A rain-map attached to his paper shows that a scanty rainfall of less than 10 inches per annum has been the usual average for about half the continent, and less than 20 inches for another quarter of it, leaving only a well-watered fringe chiefly confined to the eastern and extreme northern sides. The change in climate has, then, affected Australia as a whole rather than as a part, and there have not been left any isolated regions where a different environment of sufficient intensity might by a process of natural selection have led to the divergent evolution of a portion of the Australian aborigines. There exist also no physical barriers to a free intercourse between the various separated portions of the tribes, so that in Australia itself there was no isolation of a geographical form to foster any tendencies to variability of type. Another form of isolation of considerable importance is sexual isolation. This is also called by Romanes physiological isolation. By it is meant a degree of intertility between groups of intergenerants which leads to the extinction of the offspring. This is what occurs in natural selection, whereby there is only a survival of the fittest, the less fittest to the environment or changed conditions disappearing from the scene. Romanes points out that such natural selection cannot conduce to diversity of type, for it is only the fittest type that survives, and the unfit become isolated from the other by a process of extinction. So that, if natural selection has been at work amongst the aborigines to fit them for the various physiographic changes that have occurred from time to time, its effects have all been in the direction of monotypic variation. Another kind of sexual isolation is a certain degree of infertility, which may exist even between different

varieties of the same species, and much more so between different species. If it were not so, varieties and species would after a time become indistinguishably blended so as to lose their specific characters. This infertility in crossing varies greatly in different races. The English are said to be less fertile in crossing with the Negro than are the French and the Spanish, and also with certain aboriginal inhabitants of America. It cannot be said that there is any appreciable element of aboriginal half-breeds in any part of Australia, nor have the Malays left any special impress on the shores of the Northern parts. It is stated that there are some evidences of a superior race having left an impress on a portion of the Australian aborigines, probably towards the eastern littoral portions of Australia, a part that, according to Prof. Tate in his above quoted paper, since the Pluvial Epoch, has gained accessions to its flora from the Indo-Malay province.

The above observations respecting a few of the conditions of life and customs of the Australian aborigines seem to show that these have not been favorable to evolution towards divergent types. For it must be remembered that, although a collection of organisms has not shown any evolutionary progress, it does not at all follow that it was because it had no evolutionary power. Such a condition may be considered as non-existent in biology. Where no progress exists it is because the forces at work are mutually antagonistic, and thus bring about a condition of equilibrium. It is as true in biology as in physics that a body set in motion by a force will continue in motion until stopped by a force equal to that which set it in motion. The tendency to individual variability which is always existent is the initial propelling power in organic Nature, and isolation and heredity are the extraneous forces which may, according to circumstances, accelerate, retard, or bring to a condition of rest the body affected. The direction of evolutionary progress will also be the resultant of the respective strengths of these two latter forces, whilst the rapidity or momentum of the changes will depend on the power of the initial force; that is, the tendency to variability. The familiar diagram of the parrallelogram of forces will make clear what is meant. Let A be a body of intergenerants set in motion by a force BA (variability) in the direction of X (evolution). If two other forces CA (isolation) and DA (heredity) of equal influence act on the body A, there will be no disturbing element as to direction, but they may have an accelerating or a retarding effect on motion according as to whether their line of action is the same as, or

opposed to, that of BA (variability). If, however, one of the forces CA (isolation) is stronger than DA (heredity), and is represented by the line EF, then the evolutionary direction of the body will be towards Y (divergent evolution).



And whilst referring to the uniformity of type amongst Australian aborigines, it is not to be inferred that there are not a number of individual variations in personal appearance, for Baldwin Spencer and Gillen remark that, whilst conforming generally to the usual Australian type of features, there is very considerable difference between various individuals. In some the pronounced curve of the nose gave superficially a certain Jewish aspect, though in many this curve was wanting. It would, therefore, be quite possible by a process of discriminate isolation; that is, a breeding of like with like, or those having characteristic resemblances, to cause a divergent evolution from the common type. As the authors quoted show, the tendency to variability is there, and it is maintained that that is the initial motive power.

With these few remarks I must draw this address to a close by suggesting that an interesting investigation might

be made respecting the proneness or not of the Australian aborigines to vary individually as compared with more mixed or less purely bred races. Prof. Pearson and his colleagues in the *Philosophical Transactions* of the Royal Society, London, have, during the past few years, published *Contributions to the Mathematical Theory of Evolution*, showing how variation may be exhibited by mathematical formulæ and curves, such curves arising in many physical, economic, and biological investigations, as, for instance, various types of anthropological measurements. They say, "if measurements be made of the part or organ in several hundred or thousand specimens of the same type or family, and a curve be constructed of which the abscissa x represents the size of the organ, and the ordinate y the number of specimens falling within a definite small range, $d\,x$ of organ, this curve may be termed a frequency curve. The centre or origin for measurement of the organ may be taken as the mean of all the specimens measured. In most cases, as in the case of errors of observation, they have a fairly definite symmetrical shape, and one that approaches with a close degree of approximation to the well known error or probability-curve. A frequency-curve, which for practical purposes can be represented by the error-curve, will be termed a normal-curve. When a series of measurements give rise to a normal-curve, we may probably assume something approaching a stable condition; there is production and destruction impartially round the mean. In the case of certain biological, sociological, and economic measurements there is, however, a well-marked deviation from the normal shape, and it becomes important to determine the direction and amount of such deviation." The more data and the greater the number of individual observations there are, the more correct would be any such comparative measurements, and we may confidently expect that the projected extended anthropological investigations of Prof. Spencer and Mr. Gillen will add greatly to the already accumulated store. The presumption is that such an enquiry would show that the curve would approach more nearly a normal-curve in so pure a type as the Australian aborigines than in the more mixed European races.

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——— Life of Sam. Wells Williams, LL.D.

——— American Math. Society, Transactions, vol. I., 1.

Philadelphia—Academy of Nat. Sciences, pt. 3, 1898; pts 1, 2, and 3, 1899; pt. 1, 1900.

——— University of Pennsylvania, Contributions, vol. II., No. 1.

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——— Smithsonian Institution, Proceedings, vol. XXI.; Annual Rep. Board of Regents, to June, 1897.

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LIST OF FELLOWS, MEMBERS, &c.

DECEMBER, 1900.

Those marked (F) were present at the first meeting when the Society was founded. Those marked (L) are Life Fellows. Those marked with an asterisk have contributed papers published in the Society's Transactions.

Date of Election.

HONORARY FELLOWS.

1893. *COSSMANN, M., Rue de Maubeuge, 95, Paris.
1897. *DAVID, T. W. EDGEWORTH, B.A., F.G.S., Professor of Geology, Sydney University.
1888. *DENNANT, JOHN, F.G.S., F.C.S., Inspector of Schools, Stanhope Grove, Camberwell, Melbourne, Victoria.
1876. ELLERY, R. L. J., F.R.S., F.R.A.S., Government Astronomer, The Observatory, Melbourne, Victoria.
1890. *ETHERIDGE, ROBERT, Director of the Australian Museum of New South Wales, Sydney.
1893. GREGORIO, MARQUIS DE, Palermo, Sicily.
1855. HULL, H. M., Hobart, Tasmania.
1892. *MAIDEN, J. H., F.L.S., F.C.S., Director Botanic Gardens, Sydney, New South Wales.
1899. *MEYRICK, E. T., B.A., Ramsbury, Hungerford, Wiltshire, England.
1876. RUSSELL, H. C., B.A., F.R.S., F.R.A.S., Government Astronomer, Sydney, New South Wales.
1894. *WILSON, J. T., M.D., Professor of Anatomy, Sydney University.

CORRESPONDING MEMBERS.

1881. BAILEY, F. M., F.L.S., Colonial Botanist, Brisbane, Queensland.
1887. *CLOUD, T. C., F.C.S., Manager Wallaroo Smelting Works, South Australia.
1880. *FOELSCHE, PAUL, Inspector of Police, Palmerston, Northern Territory, Australia.
1886. NICOLAY, REV. C. G., Fremantle, Western Australia.
1883. *STIRLING, JAMES, Government Geologist, Victoria.
1893. *STRETTON, W. G., Palmerston, Northern Territory.

FELLOWS.

1887. ADCOCK, D. J., Adelaide, South Australia.
1874. ANGAS, HON. J. H., Adelaide, South Australia.
1895. *ASHBY, EDWIN, Adelaide, South Australia.
1887. BAGOT, JOHN, Adelaide, South Australia.
1893. *BEDNALL, W. T., Adelaide, South Australia.
1887. *BLACKBURN, REV. THOMAS, B.A., Woodville, South Australia.
1886. *BRAGG, W. H., M.A., Professor of Mathematics, University of Adelaide.

1883. *Brown, H. Y. L., F.G.S., Government Geologist, South Australia.
1882. Browne, L. G., Adelaide, South Australia.
1899. Browne, T. L., Adelaide.
1898. *Browne, J. Harris, North Adelaide.
1893. Brummitt, Robert, M.R.C.S., Kooringa, South Australia.
1879. *Cleland, W. L., M.B., Ch.M., J.P., Colonial Surgeon, Resident Medical Officer Parkside Lunatic Asylum, Lecturer on Materia Medica, University of Adelaide, Parkside, South Australia.
1895. Cleland, John B., M.B., Ch.B. Syd., Parkside, South Australia.
1876. (L) Cooke, E., Commissioner of Audit, Adelaide, South Australia.
1895. Cooke, John H., Adelaide, South Australia.
1887. *Dixon, Samuel, Adelaide, South Australia.
1896. Drummond, J. H. G., M.D., Moonta.
1893. Dudley, Uriah, White Rock, S.M., Drake, New South Wales.
1890. *East, J. J., F.G.S., 3, Parade, Norwood.
1899. Ferguson, Andrew, Agricultural School, Adelaide.
1886. Fleming, David, Adelaide, South Australia.
1882. Fowler, William, Melton, Yorke Peninsula, South Australia.
1889. Fraser, J. C., Adelaide, South Australia.
1880. *Goyder, George, F.C.S., Government Analyst, South Australia.
1887. Grasby, W. C., F.L.S., Adelaide, South Australia.
1896. Greenway, Thomas J., East Adelaide.
1896. Hawker, E. W., F.G.S., Metallurgist and Assayer, Adelaide.
1899. *Higgin, A. J., Assistant Lecturer Chemistry, University, Adelaide.
1891. *Holtze, Maurice, F.L.S., Director Botanic Gardens, Adelaide, South Australia.
1883. *Howchin, Walter, F.G.S., Goodwood East, South Australia.
1899. Hughes, Samuel, B.Sc., Registrar of the School of Mines, Adelaide.
1893. James, Thomas, M.R.C.S., Moonta, South Australia.
1900. Johncock, C. F., Wilmington.
1853. (F) Kay, Robert, General Director and Secretary South Australian Public Library, Museum, &c., Adelaide.
1899. Kleeman, Richard, Rowlands Flat.
1899. *Koch, Max, Adelaide.
1884. Lendon, A. A., M.D., Lond., M.R.C.S., Lecturer on Forensic Medicine, and on Chemical Medicine University of Adelaide, Honorary Physician Children's Hospital, North Adelaide, Adelaide, South Australia.
1856. Lloyd, J. S., Adelaide, South Australia.
1897. *Lea, A. M., Government Entomologist, Hobart, Tasmania.
1888. *Lower, O. B., F. Ent. S., Broken Hill, N.S. Wales.
1874. Mayo, G. G., C.E., Adelaide, South Australia.
1888. Molineux, A., F.L.S., Secretary Central Agricultural Bureau, Kent Town, South Australia.
1897. *Morgan, A. M., M.B., Ch.B., Angas-street, Adelaide.
1884. Munton, H. S., Brighton, South Australia.
1859. (L) Murray, Hon. David, Adelaide, South Australia.
1896. *Parker, Thomas, C.E., Rockhampton, Queensland.

1883. PHILLIPS, W. H., Adelaide, South Australia.
1886. POOLE, W. B., Adelaide, South Australia.
1892. *PRIESTLEY, P. H., Unley-road, Parkside.
1885. *RENNIE, EDWARD H., M.A., D.Sc., London, F.C.S., Professor of Chemistry University of Adelaide.
1876. *RUTT, WALTER, C.E., Adelaide, South Australia.
1891. SELWAY, W. H., Adelaide, South Australia.
1893. SIMSON, AUGUSTUS, Launceston, Tasmania.
1857. SMEATON, THOMAS D., Blakiston, Littlehampton, South Australia.
1900. SMEATON, STIRLING, B.A., Adelaide.
1871. SMITH, ROBERT BARR, Adelaide, South Australia.
1887. *STIRLING, EDWARD C., C.M.G., M.A., M.D., F.R.S., F.R.C.S., Professor of Physiology University of Adelaide, Honorary Director South Australian Museum, Adelaide, South Australia.
1876. *TATE, RALPH, F.G.S., Professor of Natural Science University of Adelaide.
1886. *TEPPER, J. G. O., F.L.S., Entomologist South Australian Museum, Adelaide, South Australia.
1897. *TORR, W. G., LL.D., M.A., B.C.L., Way College.
1894. *TURNER, A. JEFFERIS, M.D., Brisbane.
1889. VARDON, HON. JOSEPH, M.L.C., J.P., Adelaide, South Australia.
1878. *VERCO, JOSEPH C., M.D., F.R.C.S., Lecturer on the Principles and Practice of Medicine and Therapeutics University of Adelaide, Adelaide, South Australia.
1883. WAINWRIGHT, E. H., B.Sc., St. Peter's College, South Australia.
1878. WARE, W. L., J.P., Adelaide, South Australia.
1859. WAY, RT. HON. SIR SAMUEL, Bart., D.C.L., Chief Justice and Lieutenant-Governor South Australia, Adelaide, South Australia.
1886. *ZIETZ A., F.L.S., C.M.Z.S., Assistant Director South Australian Museum, Adelaide, South Australia.

APPENDICES.

FIELD NATURALISTS' SECTION

OF THE

Royal Society of South Australia.

SEVENTEENTH ANNUAL REPORT OF THE COMMITTEE.

BEING FOR THE YEAR ENDING SEPTEMBER 30TH, 1900.

Evening Meetings.—Nine evening meetings have been held, of which the following is a list:—

1899.

Oct. 17—"The Fertilization of Flowers," Mr. S. Smeaton, B.A.

Nov. 21—Reports of Excursion to Port Victor. Various members.

1900.

March 20—Particulars of Science Congress held at Melbourne in January, 1900. Messrs. M. S. Clark and S. Smeaton, B.A.

April 24—Results of Easter Encampment of Boys' Field Club, Port Noarlunga. Mr. E. Ashby.

May 15—"How Plants Live and Grow," Mr. J. G. O. Tepper, F.L.S.

June 19—"Seeds and their Distribution," Mr. S. Smeaton, B.A.

July 17—"The Structure of Shell Fish," Mr. R. J. M. Clucas.

Aug. 21—"The Leaves of Plants," Miss E. F. Haycraft, B.Sc.

Sept. 18—Annual Meeting, Chairman's Address, "Australian Birds," Mr. E. Ashby.

The attendance at these meetings has been well sustained, being greater than the usual average, and almost as high as for any year during the last decade. A special feature has been a course of papers on Structural Botany. In addition to the seeds and leaves of plants, the chemistry of their growth and the question of fertilization have been dealt with

Other points are to be touched upon in subsequent addresses.

As a change from botany, one paper treateed of the structure of Mollusca, and at the Annual Meeting the Chairman took up the subject of birds, which has not occupied much attention with us since the inception of the Ornithological Association. Exhibits have, as usual, covered a wide range in Natural History, and have formed an interesting feature of these meetings.

Excursions.—Twelve excursions have been held during the year as under:—

1899.

Oct. 7—Happy Valley.
Oct. 21—Agricultural College.
Nov. 11-13—Port Victor, &c. (three days).
Dec. 9—Glen Stuart (Morialta Waterfalls), via Norton's Summit.

1900.

March 17—Dredging, Port River.
May 19—Grange and Semaphore Beach.
June 16—Brighton.
" 23—"Rostrevor," Magill.
July 26—Black Hill.
Aug. 18—Stonyfell.
Sept. 3—Golden Grove (whole day).
" 22—National Park (Waterfall Gully portion).

These excursions have covered a wide area, and have given opportunity for the study of most branches of Natural History, Geology, Botany, Zoology (both land and marine), Conchology, and Entomology having been included in the scope of the investigations. The most conspicuous feature of these excursions was a three days' visit to Port Victor and neighbourhood in November, 1899, when about 30 members and friends spent a pleasant and profitable time at that favourite seaside resort.

Several kinds of plants not to be seen in the hills near Adelaide were then gathered, while 53 species of birds were identified, and chitons and other marine specimens obtained. An attempt was made to find Selwyn's historic Rock in the Inman River, but its identity could not be clearly established, although the outcrop recorded in its vicinity was found. It was supposed that the rock in question has been covered up since its re-discovery by Professor T. W. E. David and Mr. W. Howchin, F.G.S., in 1897. The excursion to the foot hills west of Golden Grove introduced a new locality for these outings, and brought a somewhat distinct character of vegetation under

notice. Successful results were obtained from the excursions to Happy Valley and Black Hill, whilst fresh ground was traversed at some of the more familiar destinations. A visit to the Agricultural College at Roseworthy, and to the Estate of "Rostrevor," Magill, lent pleasing variety to the ordinary expeditions of the Section. A dredging trip was held, as usual, during the year. At some of the excursions the Boys' Field Club joined forces with the Section, and these combined outings were, it is hoped, mutually profitable.

The attendance at the excursions shows continued interest in this part of the Section's operations, and at the last outing there were more than 30 members and friends present.

Fauna and Flora Protection Committee.—A separate report is presented from this Committee, and shows that the question of Legislation for the Protection of Birds is still receiving earnest attention.

Melbourne Science Congress.—Several members of the Section attended the meetings of the Australasian Association for the Advancement of Science held at Melbourne in January, 1900. Some of the important papers then read, and of the excursion then arranged were subsequently brought under the notice of the members of this Section at the evening meetings.

Proposed 19th Century Festival of Literature, Science, and Art.—Representatives of this Section were appointed on the Committee for this proposed celebration, but after several meetings had been held it was decided to abandon the scheme. In anticipation of this gathering being held, no conversazione was arranged for last year in connection with the Section.

Proceedings.—Beyond the report issued with the Royal Society's Transactions, no printed account of last year's proceedings has yet been published, but it is hoped ere long to combine that and the present year's report in one volume.

Library.—During the year it was decided to establish a lending library in connection with the Section, the nucleus having been presented by Mr. T. D. Smeaton, and members have been asked to donate suitable works for the Library. Your Committee would take this opportunity of again reminding members that they have access, so far as reference is concerned, to the Royal Society's Library, which, it may be mentioned, is now being catalogued.

Membership.—There has not been so large an acquisition of new members during the year as might be wished. Your Committee hope that members will endeavour to induce their friends to join the Section, and so help to counter-

balance the loss that is always to be expected. The number now on the roll is 90.

Financial.—The receipts from subscriptions (£17) have considerably exceeded the disbursements (£8/9). Only £10 has been received in the way of grant from the Royal Society.

EDWIN ASHBY, Chairman.
W. H. SELWAY, Hon. Sec.

Adelaide, Sept. 17, 1900.

TWELFTH ANNUAL REPORT OF THE NATIVE FAUNA AND FLORA PROTECTION COMMITTEE OF THE FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA TO BE PRESENTED AT THE ANNUAL MEETING, 18TH SEPTEMBER, 1900.

The Committee have met at intervals in the past year.

Regarding the Forest Reserves, the Committee received, in October last, a letter from the Commissioner of Crown Lands informing them "that all land recommended by the Conservator of Forests to be retained for forest culture is so retained, and wherever suitable land is available it will be set apart for the purpose." Information was however, recently received from Wirrabara that a perpetual lease of 277 acres in the forest had been granted to one man, and at the request of the Secretary, Mr. John Darling, M.P., asked in Parliament some questions of the Commissioner on the subject, receiving the reply that all Forest Reserves were preserved that were worth preserving.

The Birds' Protection Bill referred to in our last report, having lapsed, has been this year re-introduced by Mr. Playford, but in a different form.

The Committee were disposed to join the Bird Protection Society in asking that the Bill should be withdrawn, as many important provisions contained in their own Bill, upon which this one had been founded, were omitted from it. Two of the members waited upon Mr. Playford with this end in view, but, after discussing the question with him, thought it would be better to allow the Bill to go on, and endeavour later to get introduced some amendments to meet their own views. So little progress has, however, been made that there seems little probability of the Bill being passed this session.

EDWIN ASHBY, Chairman.
M. SYMONDS CLARK, Hon. Secretary.

Adelaide, September 18, 1900.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Receipts and Disbursements for the Year 1899-1900.

Dr. Receipts.	£	s.	d.	Cr. Disbursements.	£	s.	d.
To Balance brought forward	4	3	5	By Printing	3	4	0
" Subscriptions	17	0	0	" Postages and Sundries	4	2	6
" Grant from Royal Society	10	0	0	" Attendance	1	2	6
					8	9	0
				" Subscriptions forwarded to Royal Society ...	17	0	0
				" Balance in hand	5	14	5
	£31	3	5		£31	3	5

Audited and found correct,

J. W. BUSSELL, } Auditors.
J. S. LLOYD, }

Adelaide, 17th September, 1900.

W. H. SELWAY,
Hon. Secretary and Treasurer.

ASTRONOMICAL SECTION

OF THE

Royal Society of South Australia.

EIGHTH ANNUAL REPORT.

The Committee have to report that the Section has held six ordinary meetings during the past year, and subjects of interest have been discussed, such as meteors, sun spots, &c. Some of our members kept watch for the Leonid showers in November last. Mr. Russel gave a popular lecture, entitled "An Astronomical Evening," illustrated by lantern views, at the Society's room, to a good attendance. In June the President, Sir Charles Todd, gave an interesting paper on "The Sun and its Eclipses," illustrated by elaborately prepared diagrams, which he repeated (by request) for the benefit of the general public a few weeks later at the Royal Society's Room, at which there was also a large attendance.

The Committee have met six times for business. The Section now has three English magazines, which treat of astronomical subjects, and members can obtain them for perusal on application to Mr. Hurst, office of the Postmaster-General, Adelaide.

The "Astronomical Notes"—published monthly sinec July, 1892, and consequently now in their ninth year—have appeared with consistent regularity during the past year, and, as formerly, have proved of a highly satisfactory nature.

The question box is still open to enquirers.

Adopted at the annual meeting of the Section, held at the Adelaide Observatory on the evening of Tuesday, September 11, 1900.

C. Todd, President.
W. E. Cheesman, Hon. Secretary.

ASTRONOMICAL SECTION OF THE ROYAL SOCIETY, S.A.

Balance Sheet for Year 1899-1900.

Dr.	£	s.	d.
To Balance, 1899	29	7	10
" Subscriptions Received	9	2	6
" Interest	0	16	7
	£39	6	11

Cr.	£	s.	d.
By Subscriptions paid to Royal Society	9	2	6
" Advertisements	0	17	6
" Postage	3	2	0
" Printing " Monthly Notes "	2	4	0
" Lantern, &c.	1	2	6
" Caretaker Royal Society's Kooms	0	5	0
" Rubber Stamps...	0	10	6
" Magazines	2	12	5
" Minute Book	0	4	9
" Stationery and Printing	0	14	6
" Balance	18	11	3
	£39	6	11

Read at Annual Meeting held 11th September, 1900, and adopted.

C. TODD, President. W. E. CHEESMAN, Hon. Sec.

Audited and found correct, 10/9/00.

RICHARD F. GRIFFITHS.

GENERAL INDEX.

[Generic and specific names in italic type are described as new.]

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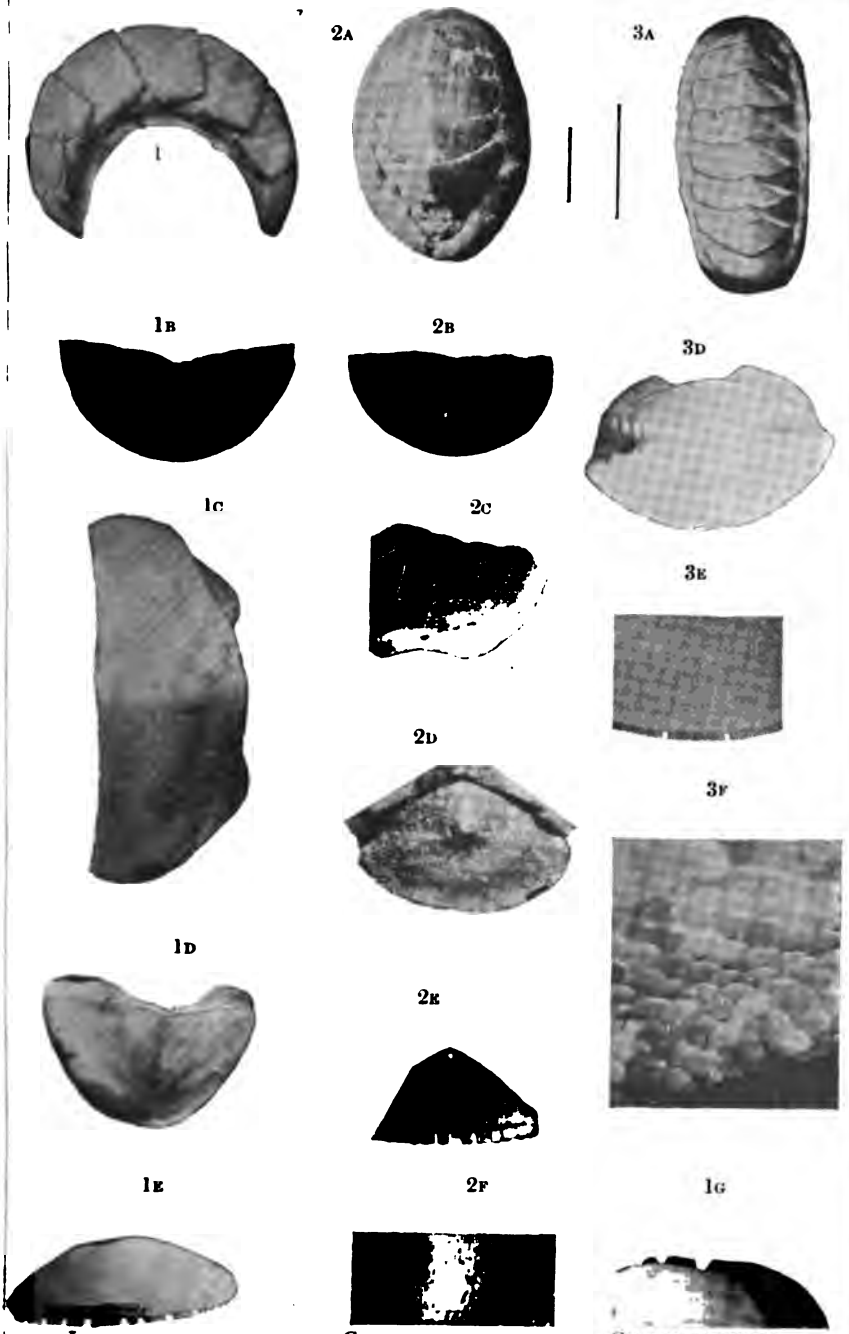

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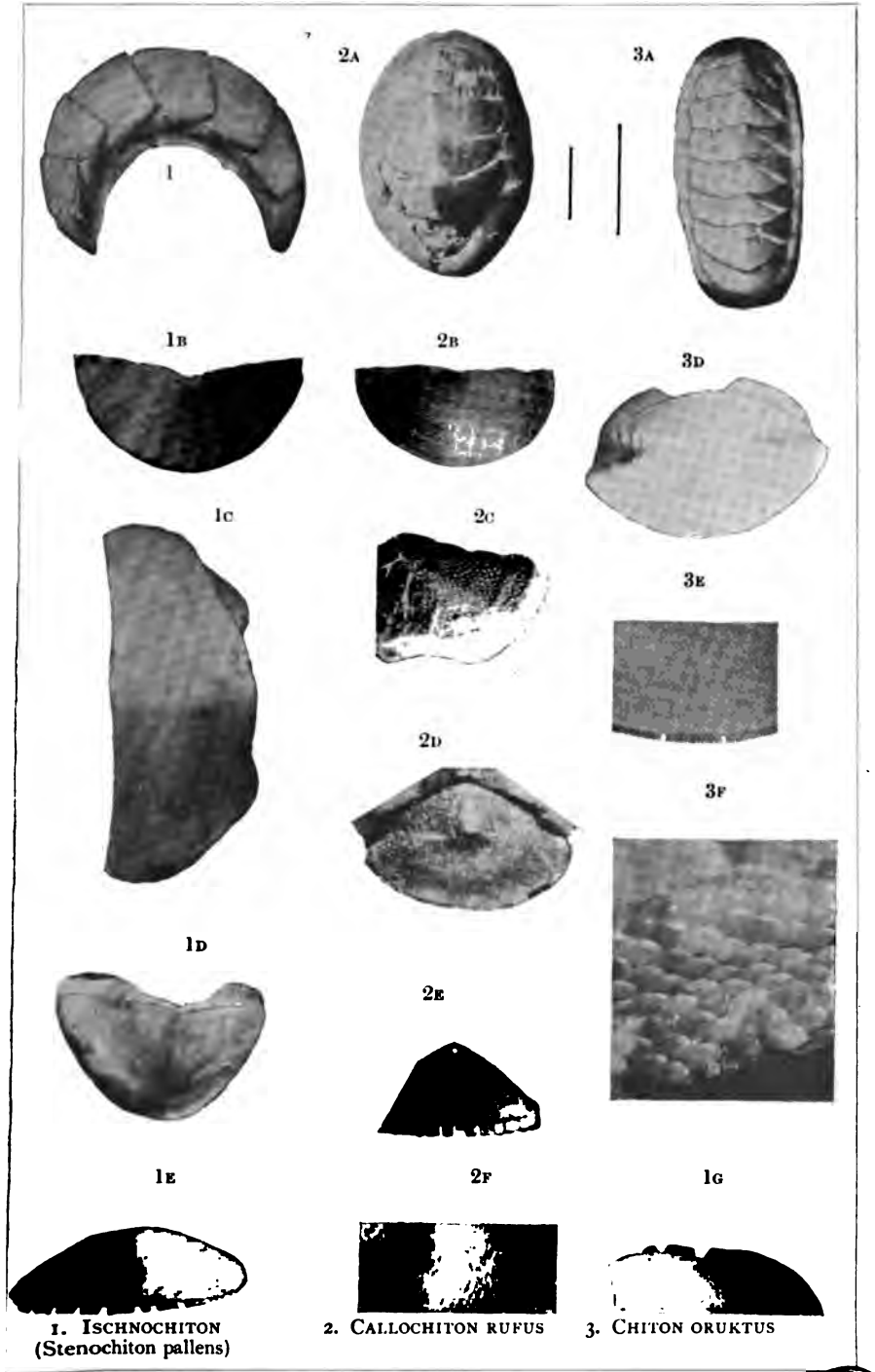

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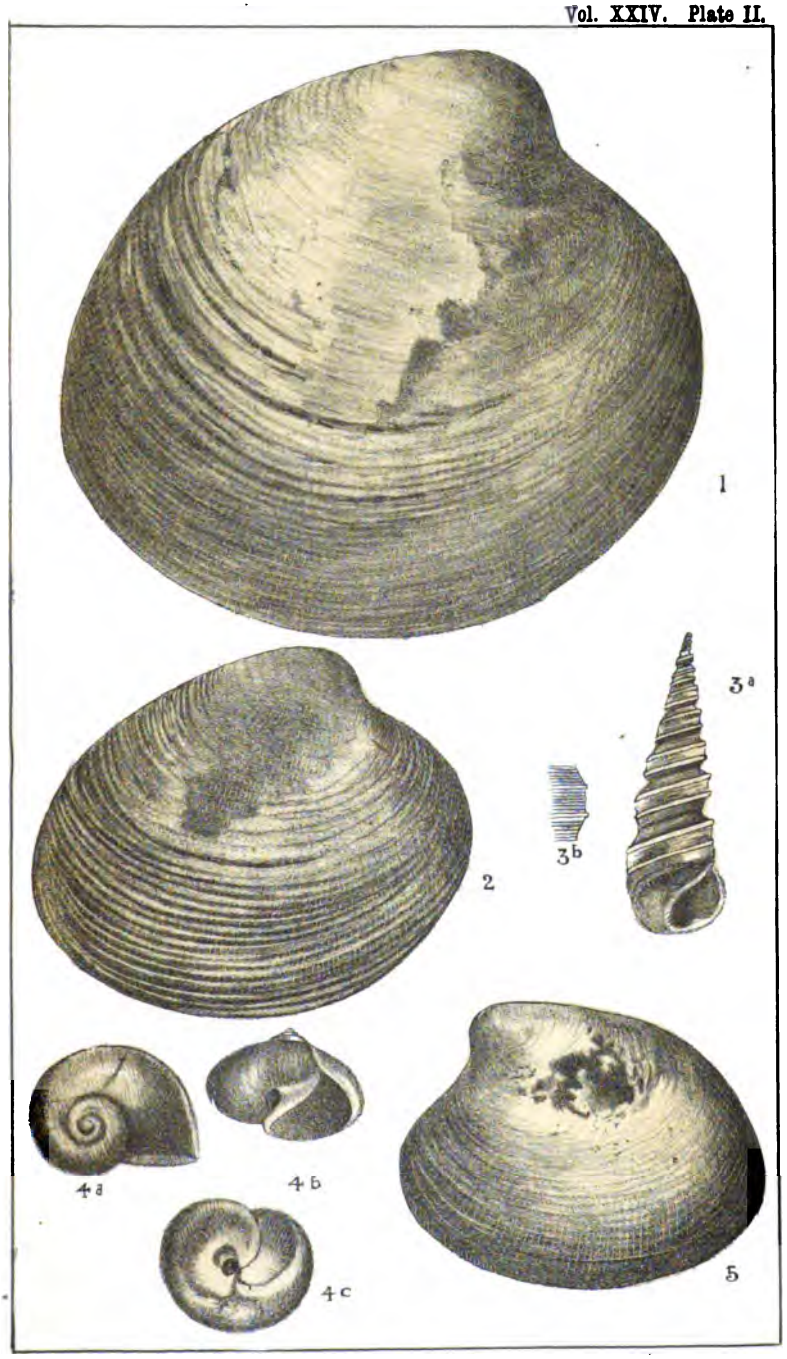

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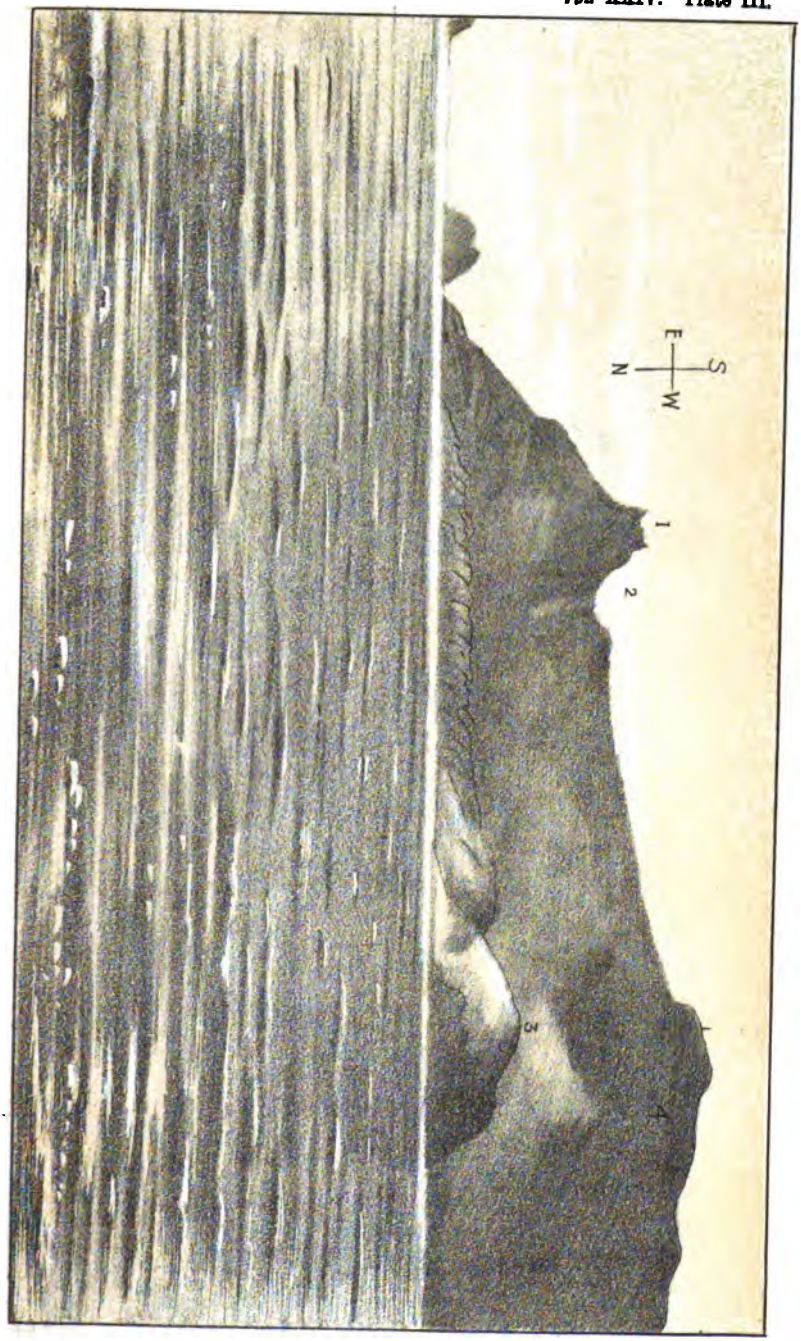

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SUGGESTIONS ON THE ORIGIN OF THE SALT LAGOONS OF SOUTHERN YORKE PENINSULA.

BY WALTER HOWCHIN, F.G.S.

[Read December 4, 1900.]

INTRODUCTORY.

The physical features of the country forming the "foot," or southern portions of Yorke Peninsula, are very singular and interesting. Taking the latitude of Stansbury as a northern limit, the district includes the Hundreds of Dalrymple, Melville, Moorowie, Parawurlie, Coonarie, Carribie, and Warrenben, extending about forty miles by twenty miles, or an area of 800 square miles. Throughout this considerable extent of country there are no rivers or running streams, and, consequently, the drainage of the land finds no outlet to the sea. Under such conditions it follows, as a matter of course, that the inland centres of drainage become the repositories of saline deposits from the concentrated mineral substances in the waters, but there are special features pertaining to the physiography and geology of the country which makes the origin of the lagoons a subject of considerable interest.

The unusual feature of hundreds of saucer-shaped depressions, irregularly scattered over most of the country named, have to be accounted for. The official maps, on a scale of one inch to the mile, record no less than 200 within the district, but the maps do not include a vast number of minor depressions which are frequently met with in travelling through the country, and which may or may not contain saline deposits. In a recent visit to the locality I observed many such areas, which do not rank as lagoons; they receive but little drainage, and the bottom, instead of being a lake, support a saliferous flora. Whatever may have caused these remarkable superficial depressions, it is evident they have had a common origin, and the agency that has produced these results must have operated over a wide extent of country.

THE SALT LAGOONS NOT OF MARINE ORIGIN.

It would be an easy solution of the difficulty if we could explain these scattered saline areas as the remnants of a retreating sea, and some of the phenomena under observation are

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(*a*) Sea cliffs on eastern coast line both north and south of Stansbury.

(*b*) Small local occurrence in sea cliff west of Troubridge Hill, on south coast.

(*c*) At Corney Point a three feet bed of Eocene limestone, in a very limited lateral extension, rests immediately upon the metamorphic rocks.

(*d*) At Point Turton, in Hardwicke Bay, occurs the most important exposure of these beds in the district.

(*e*) At Brutus Castle, Sec. No. 74, Hund. of Parawurlie, an inland cliff of Eocene can be seen not far from the coast.

(*f*) Hund. of Coonarie, Sec. No. 205, about three miles south-east from Warooka and one mile east of Piesey Trig., a considerable exposure of limestone of this age occupies the slope of the hill near the public road.

(*g*) Inland cliff about four or five miles from coast at Sturt Bay.

(*h*) Another exposure in the same Hundred, in or near Section 75, about one mile from the coast.

(*i*) Hundred of Melville, Sec. No. 254, near seven road ends, between Yorketown and Edithburg.

(*j*) In the same Hundred, a well-sinking in Section No. 265 E., proved the Eocene limestone at a depth of 60 ft. from the surface. In another sinking, on the adjoining section, No. 264, and situated on the other side of the public road, the limestone was also met with at about the same depth.

As the outcrops above mentioned have but a limited local extension, and the limestone is but very rarely met with in sinking wells, it is evident that the Eocene beds in the district must be regarded as widely scattered outliers that are the remnants of what originally was a continuous formation.

Removal of Material by Chemical Solution.

The removal of the Eocene limestone from so large an area is a notable fact, and one that cannot be accounted for on the assumption of sub-ærial erosion, for no such mechanical agent of transportation as running water exists throughout the district to-day, nor is there any indication in the physical contour of the ground, or in the alluvial deposits, that it has operated to any great extent in post Eocene times. All the facts that are available seem to point to chemical *solution* as the probable agent of removal.

That extensive chemical change and reconstruction have been effected over the area in question is apparent from many distinct lines of proof. At Point Turton and elsewhere the

fossiliferous limestone has become more or less altered by solution and redeposition, which in some cases have entirely obliterated the organic features of the rock. Over the country from which the Eocene limestones have disappeared there also occur important secondary deposits which have apparently been formed by the destructive chemical agents operating on the older limestones; these secondary deposits are mainly dolomitic travertine, calcium carbonate, sodium chloride, and gypsum.

SECONDARY DEPOSITS RESULTING FROM CHEMICAL SOLUTION.

Dolomitic travertine, in varying thickness, is very generally distributed over the district, and in many instances rests directly on the glacial clay. It is improbable that the travertine limestones have been formed by the segregation of carbonate of lime from the glacial beds which underlie them, as the latter seem to be singularly destitute of calcareous matter. The thickness of these beds, in some cases, amount to no less than twenty feet, which demands a very considerable repository of calcium carbonate in the subsoil to produce so thick a travertine crust. It is not improbable that the Eocene limestones have been entirely substituted over a great extent of the country under review, passing by solution and reconstruction into the dolomitic and other equivalents which have formed in close proximity to the original limestone beds.

Much of the calcium carbonate, when in a state of solution, would doubtless be carried some distance from its source by subterranean waters, so that an area that is by this means losing its rock material will naturally exhibit irregularities of surface, including saucer-shaped depressions. In most limestone districts loss of material by solution leads to the formation, not only of subterranean caves, but superficial depressions popularly known as "crab holes," "swallow holes," or "Bay of Biscay country." The existence, therefore, of numerous sunken areas in Southern Yorke Peninsula can be naturally correlated with the disappearance of the Tertiary limestones from much of the lagoon country.

In some parts of the Great Salt Marsh, and along the West Coast, as well as behind Cape Spencer, there is a remarkable deposit of almost pure carbonate of lime, perfectly white, and with the physical features of whiting. It is undoubtedly a secondary depost of calcareous material that has accumulated, not from solution, but from mechanical waste. I was not able to visit the localities where it occurs, but I am informed by residents of the district that it exists in very pure deposits up to seven feet in thickness, or even more. In 1889*

* Trans. Roy. Soc. S. Aus., vol. XIII. (1889-90), p. 113.

Prof. R. Tate drew the attention of the Society to the existence of this interesting formation, and referred its origin to "the accumulation of exfoliated shell substance, washed out of the incoherent shell banks." This seems a plausible explanation of its origin, and, as such, does not fit in to the phenomena with which we are dealing in this paper. The natural whiting forms by a rearrangement of recent shelly material, and not from solution of the older Tertiary limestones as in the case of the travertine deposits.

The chemical action which has led to the disappearance of the Eocene limestones can be easily determined. Practically all the rain that falls in the district is retained in the land or in the subsoil, therefore the whole of the carbon dioxide in solution (H_2CO_3) becomes locally available in setting up the initial chemical change. During the wet months of the year the porous limestones would become saturated with rain water, and a certain portion of the calcium and magnesium carbonates would pass into solution when attacked by the free carbonic acid in the water. The dry months of summer cause a desiccation of the superficial stratum, and the mineral-charged waters are, in consequence, drawn towards the surface, and at a point where evaporation becomes possible the free carbonic acid escapes, leaving a calcareo-magnesian carbonate, or dolomitic limestone, as a crust. If such a process of change is continuous (and it must be so as long as the climatic conditions remain as at present), it is only a question of time when the marine limestones will suffer a complete reconstruction under new chemical combinations. The few scattered outliers of this formation which occur in the district, and their varying thickness, mark the differential degrees in which this work of chemical change is being effected at respective points. It is a slow process, and the amount of material that has been removed is very great, but is not greater than has been achieved by the same acidic solvent in other parts of the world.

In addition to this secondary deposit of dolomitic travertine we have to account for the considerable deposits of sodium chloride and gypsum, which are also characteristic of this country. Common salt, scraped from the beds of the lagoons is exported annually from the district to the extent of 35,000 tons*; and in most of the lakes gypsum forms in the saliferous layer which extends to a few feet from the surface. The more soluble sodium chloride assumes the solid and liquid conditions alternately with the dry and wet sea-

* The export of salt during the ten years, 1890-1899, has risen from 5,598 tons to 35,053 tons.

sons of the year. The existence of the lagoons, as sunken areas, is an advantage of the greatest practical importance under present conditions; indeed, nothing less than the salvation of the country. By their existence the concentration and localization of the saline substances become possible, and by this means the higher lands are drained of their salt, and rendered sweet. A flood in this country is an event greatly to be dreaded. If the waters rise above their normal level and empty themselves into the numerous *cul de sacs* which the configuration of the country supplies, the sweet herbage is killed up to the level of the storm waters, and a new flora, of a salsolaceous type, takes its place. Several examples of this deterioration of the soil, caused by a flood that occurred a few years ago, were pointed out to me in my journey. Good dark soil that had previously grown heavy crops was now bare except for a few plants whose habits of growth fitted them for a saline soil; the white crystals of salt could be easily recognised as glistening particles on the background of the dark soil. In one situation affected in this way a farmer showed me a well that was filled by the waters of the flood—before the inundation the water was comparatively sweet, and was used for farm purposes, but since the flood referred to the water in the well is like brine, and quite useless.

Fine examples of gypsum crystals can usually be obtained by digging in the silt of the lagoons. The gypseous layer commences about a foot from the surface of the lake deposit. Some interesting examples, exhibiting complex twinning are obtained in the Cape Spencer locality, but I had not time to visit the spot. On the southern side of Lake Fowler (the largest of the lagoons), a very remarkable deposit of granular gypsum lines the shores of the lake in a range of hills 80 feet high. The hills consist almost entirely of pure gypsum in the form of small crystals the size of coarse sand. In places the gypsum partakes of the character of a white powder, resembling flour, and the deposit, as a whole, is so pure that it is simply shovelled into sacks and carted away to the mill for commercial purposes. How such a clean deposit could have been formed, and in solid mass, so high above the present level of the lake, are questions not easy to answer.

The association of gypsum and rock salt with dolomitic limestones is so general an occurrence as to suggest community of origin. This subject has been dealt with very fully by Dr. Sterry Hunt in his "Chemical and Geological Essays," and throws considerable light upon our present enquiries. In the Murray districts and elsewhere in South

Australia the lower Tertiary limestones are associated with considerable saline and gypseous ingredients, but the conditions in Yorke Peninsula are much more favorable for the conservation of these minerals, because there is practically no outward drainage for the waters of the district. The distribution of sulphur is very general in the organic, as well as inorganic, world, and, therefore, offers no difficulty in accounting for the presence of gypsum under the conditions named. Sulphate of magnesia is easily soluble, and would react on the calcium carbonate that had passed into solution by excess of carbonic acid, forming the resultants, sulphate of lime and bicarbonate of magnesia; the former crystallising out as selenite, and the latter, uniting with calcium carbonate, forming the dolomitic travertine.

IMPORTANCE OF THE GLACIAL CLAY IN THE PHYSICAL FEATURES.

One of the chief determining factors in the physical features of Southern Yorke Peninsula is, undoubtedly, the glacial clay, which, as described in a previous paper, seems to underlie most of the district. At Point Turton, on the north coast, and in the sea cliffs a little west of Troubridge Hill, on the south coast, the Eocene limestone is seen to rest directly on the glacial clay. This formation of compact clay supplies the base—the impervious floor, on which for the most part the newer formations of the district rest. Had no such impervious barrier existed, the superficial drainage would no doubt have found its way to greater depths, and carried the soluble minerals beneath the surface. As it is, at present the chemical reactions have largely taken place above this floor line, and have become intensified by evaporation and concentration carried on through a very prolonged period.

The depth of the lagoon floors below the normal level varies from a few feet up to probably forty feet. At the outer rim of the depression the ground usually has a gentle slope towards the lake, with steep or nearly vertical cliffs near the water's edge. As some of these basin-shaped hollows have been excavated in glacial sands and clay, it is certain that, in some cases, other agents besides chemical solution have been responsible for their excavation in part. It is noticeable that the cliffs surrounding the lagoons are often lower or more sloping on the north-east side than the opposite. As the prevailing winds are from the south-west, it will be seen that in such instances the lower banks are in the windward direction. The beds of the lagoons are for the most part dry for a considerable part of the year, and when in this condition they expose a level surface of fine silt that might easily be carried by the wind. If a crust of salt forms over the mud flats

when the water evaporates, this, of course, counteracts the action of the wind, and conserves the fluviatile material of the lake bed; but it is difficult to imagine how these shallow depressions can be scooped out of sedimentary deposits except by the wind, and as there seems to be evidence that the banks show a tendency to sheer in the windward direction, it lends plausibility to the assumption.

Fauna of the Lagoons.

The existence of foraminiferal shells in the silt of the Yorketown Lagoon was brought under my notice by Mr. Matthews, of Yorketown. I was unable to visit the lagoon in question, but Mr. Matthews kindly placed some of the material in my hand for examination. I found a considerable number of dead shells of *Polystomella striato-punctata*, and *P. macella*. These forms are characteristically estuarine in habitat, and the individuals found in the lagoon were small, starved varieties of the species, giving evidence that their lot has been one of struggle for existence under adverse conditions. With the foraminiferal remains there also occur a few ostracoda and the gastropod, *Coxiella confusa*. The last-named may be regarded as ubiquitous in its distribution over the marginal maritime belt of Southern Australia, under brackish water conditions, as well as in many of the isolated lagoons in inland positions. No organic remains (so far as I know) occur in the circular lagoons that would indicate a distinctively marine fauna, and the presence of foraminifera in the Yorketown lagoon may probably be explained as a sporadic colony, introduced at some period by sea birds carrying foraminiferal spawn on their legs, the introduced forms maintaining a precarious existence until either the increasing salinity of the water, or the temporary drying up of the lagoon, led to the extinction of the colony.

Analogous Features in Kangaroo Island.

It may be regarded as a corroboration of the theory advocated in this paper that in Kangaroo Island several lagoons of the same type as those on the Peninsula occur in the north-east portion of the island, and under similar geological conditions. There are the same outliers of Eocene limestone separated by areas from which the limestone has disappeared. The glacial clay underlies the Tertiary limestones, and forms the retentive floors for the drainage. The lagoons also are excavated in this clay with exposure of erratics on their flanks, as has been described in the case of Yorke Peninsula.

Preliminary Note on the Existence of Glacial Beds of Cambrian Age in South Australia.

By Walter Howchin, F.G.S.

[Read April 2, 1901.]

It has recently been my good fortune to discover in our local rocks a glacial "till" of very remote geological age, and of great extent in its stratigraphical outcrop. As the formation in question has been proved at intervals over a line of strike that exceeds 200 miles, considerable time will be involved in making the detailed observations requisite for a full treatment of the subject. I have, therefore, concluded it was best to place before this society, at the earliest opportunity, a preliminary note giving the outlines of this interesting discovery.

During the past year I have paid several visits to the valley of the Sturt River, about seven miles from Adelaide, where the formation referred to first attracted my attention. The Sturt crosses the Adelaide main road near the Flagstaff Hotel, at the base of Tapley's Hill. About a mile up stream from this point the glacial beds are exposed, and for a considerable distance occupy the bed and banks of the river. The outcrop is about a mile and three-quarters wide, and include cuttings on the Hills railway line, as well as the quarry of the Metropolitan Brick Works Company, on its eastern limits.

The glacial beds rise from beneath the thick banded shales of Tapley's Hill, and are underlain by the shales and quartzites of the Mitcham and Glen Osmond series.

The lithological features of the beds are very distinctive, and when once observed can be easily recognised, even in small fragments. As a rule the formation exhibits an unstratified mass, with a mudstone base, and carries stones from the size of small grit, up to erratics several feet in diameter. These are distributed through the mass without order, and at all angles, frequently producing a local contortion in the finer sediment immediately adjacent to them. In places the mudstone is replaced with irregular and unstratified masses of sandstones or coarse grits. It is often impossible to trace the line of junction between the mudstones and these

arenaceous masses, and no lines of bedding can be found showing planes of deposition. These arenaceous masses may or may not contain erratics within their limits, as they vary in this particular. The mudstones show a characteristic weathering, splitting up into large slabs with a flakey exfoliation of the mass. At first these divisional lines might be mistaken for bedding planes; but they are evidently produced by a rough form of cleavage, and are at a high angle. This manner of weathering tends to produce sharp serrated edges along their lines of outcrop.

The true "till" beds are in places intercalated with laminated shales, grits, and thin dolomitic limestones, which do not contain erratics, and are regularly bedded. It is by these regularly stratified beds intercalated with the "till" beds that the true dip of the series can be obtained.

My first sight of this remarkable formation was sufficient to convince me that I stood face to face with a true glacial deposit, but repeated searching in the Valley of the Sturt failed to produce any indisputable evidence of glacial wear on the faces of the included boulders.* The shape of many of these boulders was often suggestive of ice action, but confirmation was needed to place the question beyond doubt. Such negative results may, perhaps, be explained from the fact that the included igneous rocks are generally much decomposed; whilst others, less liable to atmospheric influences, as quartz and quartzites, are frequently covered with a shaly skin, left by the matrix, which effectually hides the striation of the surface if existing on the stone.

I ascertained from several sources that "boulder beds" were seen in outcrop to the north of Adelaide, and, in search of fuller proofs of glacial action (if such were obtainable), I paid a visit, at the close of last year, to the neighborhoods of Jamestown, Petersburg, and Oodla Wirra, nearly 200 miles north of Adelaide, and obtained very definite confirmatory evidence. The glacial beds in these northern districts appear to have a very wide, if intermittent, spread.

At the Mount Grainger mine, seven miles north from Oodla Wirra, two rather thin "till" beds occur, intercalated with regularly bedded formations. At Petersburg, about 23 miles to the south-west of Oodla Wirra, there is a very extensive development of the glacial beds. The line of strike takes these beds close to the township, and can be seen in a wide belt of outcrop extending for many miles in the direction of the strike. To the northward of the town they form

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* Since this was written good examples of glaciated boulder hove been obtained.

a leading geological feature in the Petersburg Ranges, along which I followed their outcrop for a distance of sixteen miles. In some places fine mural exposures of the "till" were met with, and large boulders of quartzite, granite and other kinds of igneous rocks, weathered out from the "till," lie strewn upon the surface.

Jamestown is situated about twenty-one miles to the south-west of Petersburg. In the Belalie Creek, about one mile east of the town, the junction of the "till" beds with the overlying "ribbon," or banded, shales of the Tapley's Hill formation is well seen. The outcrop can be traced across the railway line, and occupies the rises on its northern side. On the cultivated land the farmers of the neighborhood have been at much trouble to clear the ground of the erratics, which are in great numbers, and in places the task has been too much to attempt, so that the stony ground is left in a state of nature. In one spot, near the boundaries of Mooreland's Farm, a fine field of erratics can be seen strewing the ground of all sizes up to nine feet in diameter.

The northern exposures of the "till" beds differ in one important particular from those of the Sturt Valley. In the latter locality but few boulders are found lying on the surface of the outcrops, whilst in the north such free erratics are extremely plentiful, probably arising from the more rapid weathering of the beds. This extensive weathering is a feature of great importance, as it permitted a freer examination of the erratics than is possible in the formation near Adelaide.

The crowning result of these observations in the northern districts, and one that has placed the question of the glacial origin of the beds beyond all doubt, was the discovery of glaciated stones of the most distinct and characteristic types. A large limestone boulder and several quartzites have been obtained which show glacial facets as well as groves and striæ.

I have ventured to refer the glacial beds described in this preliminary note to Cambrian age. At present this is only a matter of inference, but the weight of evidence seems to point in that direction.

I do not think they can be regarded as newer than the Cambrian, as they underlie a thick series of shales and limestones, so little altered that, had the latter been of more recent date than the Cambrian, they might reasonably have been expected to carry some palæontological evidence of their age; but, with the exception of *Radiolaria*, they have given negative results after repeated searchings. Further, the "till"

beds have a dip which, if persistent, would bring them under undoubted Cambrian beds at a few miles distance.

At the same time, I can scarcely see how the beds in question can be referred to a Pre-Cambrian age, as the inclusions of sedimentary rocks, such as quartzites, metamorphic shales, and limestones among the erratics, demands a pre-existing sedimentary series from which they have been derived, and which may be assumed to be of Archæan age. This discovery marks, so far as I am aware, the first observation of a Cambrian glacial age in the Southern Hemisphere, and is probably the most extensive exposure of its kind in any part of the world.

I have to express my great indebtedness to Mr. John Heithersay, who, from his intimate knowledge of the country around Mount Grainger and Petersburg, gave me very valuable assistance in carrying out my observations in that district.

A South Australian Meteorite.

Plate I.

By G. A. Goyder, F.C.S.

[Read April 2, 1601.]

This siderite was brought to the School of Mines for determination by Mr. H. W. Payne, of Rhine Villa, who states that it was found on the surface partly covered with soil, and that there were no other stones of a similar nature to be seen about the surface except one or two little flakey pieces which appeared to have fallen off the one sent. These pieces were lost in digging to try and find more large pieces. He also states that no one had seen a meteor fall in that locality. The meteorite, when received, had been a good deal knocked about with a hammer, and some of the prominences on it thus flattened; on the untouched surfaces it carries a thin coating of oxide, but does not show any wavy lines of flow. The photographic representation herewith of natural size shows the general contour and thumb-like depressions. The weight is 3,325 gms. (7½ lbs.) Specific gravity, 7.693.

A piece was sawn off, ground, polished, and etched with dilute nitric acid, which brought out the Widmanstätten figures very prominently, as seen in the accompanying drawing. Twinning lamellæ (Neumann lines) could also be seen on parts of the section, especially with a magnifying glass, but hardly in the photograph representation. This siderite appears to consist principally of *kamacite*, with thin plates of *taenite* between the *kamacite* blades, small veins and also grains of *troilite* are sparsely scattered through the section and from the quantity of phosphorus found by the analysis, *schreibersite* is also probably present.

Analysis by Mr. W. S. Chapman.

Insoluble in aqua regia	0.03
Iron	88.85
Nickel	9.07
Cobalt	0.34
Sulphur	0.75
Phosphorus	0.27
	99.31

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

XXVIII.

[Read April 2nd, 1901.]

Through the obliging mediation of my good friend Dr. Horn of Berlin I have been brought into communication with Professor Kolbe of the Royal Museum at Berlin, who has done me the distinguished favor of entrusting to my hands for examination the type specimens of a number of the Tasmanian Coleoptera described by Erichson in 1842. This generous loan has enabled me to clear up some of the enigmas of the Australian fauna and to assign to their proper places various species which in former papers I have been obliged to pass over as incapable of certain identification, especially in the genus *Heteronyx* and the family *Curculionidæ*. The results of my studies of the above-mentioned types will be found in the following pages.

CICINDELIDÆ.

CICINDELA.

C. Jungi, sp. nov. Modice elongata, sat parallela; viridis vel cuprea, labro mandibulis (his apicem versus nigricantibus) elytrisque albidis (his macula viridi communi elongata, basin attingenti, longe ante apicem desinenti, ad latera apicemque varie sinuata, ornatis); capite inter oculos (his valde prominulis) fortiter convexo, clypeo dense niveo-piloso, vertice antice longitudinaliter subtiliter strigato postice subtiliter rugulose punctulato; prothorace sat transverso, niveo-piloso, antice posticeque transversim sulcato, longitudinaliter canaliculato, subtiliter confertim rugulose punctulato, lateribus sat arcuatis; elytris vix perspicue punctulatis, margine postice haud denticulato; corpore subtus (metasterni coxarum posticarum abdominisque parte mediana excepta) antennarum articulis basalibus 4 pedibusque sat dense niveo-pilosis.

Maris tarsis anticis modice dilatatis; feminæ labro 3-dentato. Long., 5—5½ l.; lat., 1⅘—2 l.

The elytra have no markings whatever except the one common green blotch which extends from the base hindward to about the

beginning of the apical one-third of the elytra. This blotch is deeply bi-emarginate on its lateral margins and also emarginate on its hindmargin. The emargination of the hindmargin is in some specimens not deeper than those of the lateral margins, but in other examples is very much deeper (in one even becoming a long cleft extending two-thirds of the distance up the middle of the blotch towards its front margin). This species differs from *C. upsilon* as follows: form evidently more elongate and parallel; elytral markings quite different; clypeus and basal part of antennæ densely pilose; prothorax much more pilose and with less straight sides; head considerably more convex between the eyes; elytra much less distinctly punctured; labrum of female tri-dentate in front. The female examples before me have the apex of the suture distinctly spiniform, but in the unique male there is no trace of a spine; perhaps this is an abnormal specimen.

S. Australia; Yorke Peninsula (taken by Mr. Jung).

CARABIDÆ.

GIGADEMA.

G. rugaticolle, sp. nov. Fem. Elongatum; parallelum; minus nitidum; piceum, corpore subtus pedibusque rufescentibus; capite modico, pone oculos modice angustato, sat sparsim subfortiter punctulato et transversim perspicue rugato; labro sat elongato; prothorace sat cordiformi, quam longiori fere sesquilatiori, canaliculato, in disco toto sat æqualiter sat fortiter transversim strigato, in partibus marginalibus omnibus sat fortiter minus sparsim punctulato, lateribus late deplanatis, basi bisinuata; elytris striatis, striis punctulatis, interstitiis nullo modo convexis, subtiliter (ut striæ) punctulatis, puncturis in interstitiis nonnullis triseriatis; femoribus anticis ad basin subtus obtuse angulatim dilatatis; ligula planata, parte media leviter concava. Long., 16 l.; lat., 5½ l.

This species is distinguishable among its allies by the absolutely flat interstices of its elytra (the puncturation of which is very fine and runs partly in two, partly in three, longitudinal rows) and the strong uniform transverse wrinkling of the disc of its pronotum. Compared with *G. longipenne*, Germ., of same sex, it is of somewhat similar, but a little wider form; its labrum is much more obtuse at the apex; its head does not differ much except in the upper surface being conspicuously strigate transversely; its ligula is of entirely different form; its prothorax does not differ much in outline except in the middle part of the front margin being more prominent; the marginal flattening of the pronotum is much wider and better defined (even more

so than in *G. Bostocki)*; the disc of the pronotum is strongly strigate and therefore opaque; the elytral interstices are quite flat and are more finely punctured, the punctures not running in two regular series on each interstice but on the greater part of most of the interstices in three rows; the basal part of the front femora is obtusely and widely angular beneath (in *longipenne* there is a small sharp tooth). I do not know *G. Froggatti*, Macl., or *atrum*, Macl., but it is evident from the descriptions that this present insect is very distinct from them,—the former having the "whole prothorax coarsely punctured" and its elytral interstices being called "ridges;" while the latter is described as having *inter alia* its "head without punctures" and the apical joint of its maxillary palpi triangular.

N.W. Australia.

DIABATICUS.

D. australis, Er. Some time ago I took an example of *Diabaticus* on the Dividing Range, Victoria, which appears to me to be a variety of the Tasmanian *D. australis*. It differs from the type in the front one-third part of its elytra being of the same ferruginous colour as the prothorax. The interstices of its elytra being more absolutely flat than those of *australis* suggest the possibility of specific distinctness, which however could only be decided by examination of numerous specimens. I do not think the insect has hitherto been recorded as occurring on the mainland of Australia.

D. (?) tumidiceps, Blackb. and *minor*, Blackb. In Tr. R.S., S.A., 1889, p. 133, I very doubtfully attributed these species to *Diabaticus* provisionally. In Pr. L.S., N.S.W., 1898, p. 494, Mr. Sloane says that they cannot in his opinion stand in *Diabaticus* but require a new generic name. I take this opportunity of saying that I agree with him. As he is, I believe, at present working on the *Lebiides* I leave to him the task of dealing more satisfactorily with their generic position.

SILPHOMORPHA.

S. difficilis, sp. nov. Lata; sat nitida; supra fere tota piceo-nigra, corpore subtus antennis palpis pedibusque rufis; fere lævis, punctura magna in utroque elytro prope scutellum impressa; capite prothoraceque fere æqualibus; elytris obsolete interrupte substriatis, interstitiis vix omnino planis, apice subsinuata anguste rufescenti, lateribus leviter deplanatis. Long., 4½ l.; lat., 2½ l.

This species is notable among its immediate allies by the large puncture on each elytron placed very near to, and about on a level with the hind apex of, the scutellum. The elytra are dis-

tinctly less evidently striate than those of *S. fallax*, Westw., and more evidently than those of *S. decipiens*, Westw. The prothorax is not at all explanate on the sides, the elytra broadly so, but very indefinedly, much less definedly than in *fallax*. *S. lævis*, Cast., is perhaps the species to which the present one is nearest, but it is too briefly described for any clear idea of it to be formed without seeing the type. It seems however to be differently colored having a "reddish lateral margin to the thorax and elytra" (there is no trace of such coloring in the present species) and having the "thorax bi-impressed on the posterior part" (the present species has no inequalities that can be called distinct impressions); moreover it is from a very distant locality (tropical Queensland); the probabilities therefore are decidedly against identity.

N.S. Wales (Tweed R. district).

ADELOTOPUS.

A. micans, sp. nov. Angustus, elongatus (quam *A. filiformis*, Cast., parum latior; nitidus; glaber; antennis palpis pedibus pronoti lateribus elytrorum apice corporeque subtus plus minusve piceis vel rufescentibus; capite sat lævi; prothorace quam longior sesquilatiori, antice parum (quam *A. hæmorrhoidalis*, Er., multo minus fortiter) angustato, sparsim manifeste (quam *A. filiformis*, Cast., multo minus crebre) punctulato, lateribus quam *A. filiformis*, Cast., paullo minus rectis paullo magis late recurvis; elytris ut prothorax (sed apicem versus magis crebre) punctulatis, nullo modo striatis, sutura prope apicem vix subcarinata; prosterno haud carinato. Long., 3 l.; lat., $1\frac{1}{5}$ l.

Resembles *A. filiformis*, Cast., and *aphodioides*, Westw., in its pronotum and elytra being very much more distinctly punctured than those of *dytiscoides*, Newm., *hydrobioides*, Westw., *nemosomoides*, Westw., *hæmorrhoidalis*, Er., &c. From *aphodioides* it differs *inter alia* by its puncturation being much less close and the sides of its prothorax straighter and very much less strongly recurved.

S.A. (Quorn).

A. Tasmani, sp. nov. Angustus, elongatus (ut *A. filiformis*, Cast.); nitidus; glaber; ut *A. micans* coloratus; supra haud punctulatus; prothorace (puncturis carentibus exceptis) fere ut præcedentis *A. micantis* sed lateribus etiam magis anguste recurvis; elytris (puncturis carentibus exceptis) fere ut præcedentis, sed sutura haud carinata; prosterno fortiter carinato. Long., $2\frac{4}{5}$ l.; lat., 1 l.

A very narrow species, of the form of *A. filiformis*, Cast., but differing from that species *inter alia* by its upper surface being

devoid of distinct puncturation even under a strong lens. *A. hæmorrhoidalis*, Er., is much less narrow in form, with the sides of its prothorax very much more strongly narrowed towards the apex. *A. nemosomoides*, Westw., is a still more narrowly elongate form, with the sides of its prothorax quite straight. *Hydrobioides*, Westw., *vicinus*, Cast., *apicalis*, Macl., are all *inter alia* of much less narrowly elongate form.

Tasmania (Lake District).

A. creberrimus, sp. nov. Subovalis, minus angustus, minus convexus; minus nitidus; supra piceus, antennis palpis pedibus prothoracis basi lateribusque elytrorum lateribus et corpore subtus rufescentibus; glaber; capite creberrime ruguloso, genis ut *A. ipsoidis*, Westw., dilatatis; prothorace ut *A. ipsoidis* conformato, supra sat æqualiter confertim ruguloso; elytris totis (humeris summis exceptis) crebre punctulatis, puncturis suturam versus sat magnis sat rugulosis (ut *A. ipsoidis)* sed latera apicemque versus multo minoribus, stria subsuturali manifesta; prosterno carinato. Long., $3\frac{4}{5}$ l.; lat., $1\frac{3}{5}$ l.

Allied to *A. ipsoides*, Westw., but of evidently more elongate form, with the sculpture of the pronotum very much more crowded and evenly distributed and the whole surface of the elytra except a very small space at the shoulders very distinctly punctured. In *ipsoides* the front two-thirds of the inner half of each elytron is strongly punctured (but much less closely than in *creberrimus)* while the external half of each elytron (except close to the lateral margin) and the apical portion are almost puncture-less. *Cylindricus*, Chaud., is no doubt another ally of *A. ipsoides;* its prosternum is described as non-carinate. *A. obscurus*, Cast., is stated by Dr. Gestro (Ann. Mus. Gen., 1884, p. 303), on the authority of Castelnau's type and a co-type from Macleay, to be identical with *subopacus*, Macl. I have a specimen of *subopacus*, Macl. (compared with the type), which is a much smaller insect than *creberrimus*, with pilose elytra and the elytral puncturation. not interrupted even on the shoulders.

S. Australia (Basin of Lake Eyre).

PROMECODERUS.

P. Sloanei, sp. nov. Fem.? Elongato-ovalis; nitidus; niger, vix ænescens; palpis antennis tarsisque vix picescentibus; capite convexo, sat æquali, labro medio longitudinaliter fortiter sulcato, genis (ut *P. ovipennis*, Sl.) subtus angulatim prominentibus, menti dente medio sat acuto; prothorace convexo, quam latior fere longiori, antice et postice transversim modice impresso, canali mediana longitudinali bene definita obsolete punctulata (hac sulcos transversos attin-

genti, postice subfoveato), lateribus minus fortiter (quam *P. scauroides*, Cast., multo minus fortiter) arcuatis in parte postica summa sinuatis, angulis posticis rectis; elytris modice convexis, subtiliter perspicue striatis (striis perspicue punctulatis), striis 1ª et 2ª antice fortiter extrorsum versis et prope basin conjunctim profunde sulcatis, inter has strias et suturam fovea sat profunda impressa, parte apicali subrugulosa. Long., $5\frac{3}{4}$ l.; lat., $2\frac{1}{8}$ l.

In general shape and build this species resembles an insect sent to me by Mr. Sloane under the name *P. semistriatus*, Cast. Its most striking character consists in the strong longitudinal sulcus of the labrum, which is even more deeply impressed than in any of my specimens of the small group of Tasmanian species notable for that character. The puncturation of its elytra is more marked than in any other specimen of the genus in my collection, extending in regular rows from base to apex and being quite distinct even on the lateral portions; it can hardly be the result I think of immersion in spirits. The sinuation (close to the base) of the lateral margins of the prothorax is stronger than in any other *Promecoderus* known to me. This lateral margin is continued along the base (where it becomes thicker and stronger than on the sides) for about a quarter of the width of the segment and is obsolete in the middle. The prothorax is fully as long as (if anything a trifle longer than) wide by careful measurement. The first and second elytral striæ running into a short deep fovea-like sulcus at the extreme base seems to be a good character. I cannot make up my mind as to the sex of the specimen before me. The front tarsi are not spongiose beneath, but they are very short and wide for a female,—the basal joint scarcely longer than wide and the following three joints distinctly transverse. I can find only one puncture on each side of the hindmargin of the last ventral segment, but as the setæ of the punctures are wanting and the margin itself is slightly damaged I am not sure that there may not have been two punctures on each side. The lateral foveæ of the ventral segments are not linearly produced towards the middle of the segments. The median longitudinal line of the pronotum is much like that in a specimen sent to me by Mr. Sloane as *olivaceus*, Macl. This species is as brilliantly nitid as *P. scauroides*, Cast.

Western Australia (Yilgarn District).

GNATHAPHANUS.

G. Darwini, Blackb. Mr. Sloane (Proc. L.S., N.S.W., 1899, p. 555) says that a comparison of the description of the above insect with that of *G.* (*Diaphoromerus*) *multipunctatus*, Macleay (both published in P.L.S., N.S.W., 1888, Part 2), convinces him

of their identity and that as he feels ittle doubt of *G. multipunctatus* being identical with *G. impressipennis*, Cast., he thinks *Darwini* is probably in the same case. It seems to me likely enough that my name is founded on the same species as Sir W. Macleay's; in which event, although the two names were published simultaneously my name must sink, as Sir W. Macleay's paper was read before mine; but my *G. Darwini* is perfectly distinct from a Queensland species sent to me by Mr. Sloane as *G. impressipennis*, Cast. (and in my opinion correctly named), from which it differs *inter alia* by its having no punctures on the fourth elytral interstice and none on the front one-third part of the fifth interstice. Unfortunately my *G. Darwini* is a female, and the Queensland specimen is a male,—but I think it very improbable that the female of the Queensland species has such deep elytral striæ or so strongly prominent interstices (which however are flattened,—not keel like,—except close to the base and near the apex) as *G. Darwini*.

LAMELLICORNES.

ANODONTONYX.

A. (Scitala) languida, Er. I have the type before me and find it to be an *Anodontonyx*. It is identical with the species that I regard as *A. nigrolineata*, Boisd. This confirms Burmeister's opinion that the two names are founded on the same insect, but Burmeister makes Boisduval's name the synonym,—whereas the reverse is the case (as Blanchard cites it and as it is quoted in Masters' Cat.).

HETERONYX.

Erichson seems to have overlooked this name altogether as he makes no reference to it in founding his genus *Silopa* to which he refers numerous Tasmanian species. *Silopa* however, as Lacordaire and others have shown, is quite identical with *Heteronyx*. In my "Revision of the genus *Heteronyx*" (P.L.S., N.S.W., 1889, &c.) I was obliged to pass *H. (Silopa) glabratus*, Er., *fumatus*, Er., and *hepaticus*, Er., among the species unknown to me. I have now, through the courtesy of Herr Kolbe, the types of these three species before me and can furnish the following notes on them, assigning to them their places in my arrangement of the genus.

H. glabratus, Er. This species belongs to my Section III., Group I., Sub-group II., having its labrum elevated above the clypeus, its antennæ of eight joints and its claws appendiculate. In my tabulation of that Sub-group it stands beside *H. raucinasus*, Blackb. (P.L.S., N.S.W., 1889, p. 142) along with *H. consanguineus*, Blackb. (a subsequently described species). It differs from both of them by its much less closely and more

strongly punctulate elytra, and from *raucinasus* by its much less closely and less rugulosely punctured head.

H. (Silopa) fumatus, Er. This species belongs to my Section III., Group II., Sub-group II., having its labrum elevated above the clypeus, its antennæ of nine joints, and its claws appendiculate (tabulated in Proc. L.S., N.S.W., 1889, pp. 662, &c.). It is identical with my *H. rapax*, the name of which must consequently sink into a synonym of *H. fumatus*.

H. (Silopa) hepaticus, Er. I cannot see any character of specific value to separate this species from the preceding (*H. fumatus*). I think it is a male and *fumatus* a female. In the two descriptions there does not seem to be any tangible difference beyond that the scutellum of *hepaticus* is said to be sparsely (of *fumatus*, not) punctured, and the elytral interstices in *hepaticus* to be transversely subrugulose. I find these distinctions in the two specimens except that the scutellum of *fumatus* is certainly not absolutely without punctures, though its punctures are very evidently less numerous than those of *hepaticus*. I also observe that the elytral puncturation of *hepaticus* is a trifle closer than that of *fumatus*. And here it may be noted that the puncturation of both scutellum and elytra in the type specimen of *H. rapax*, Blackb., is intermediate between that of Erickson's two species. But these very slight differences do not appear to me sufficient to found species on, at any rate unless a study of numerous specimens should show that they are persistent,—and moreover not sexual.

As I have mentioned previously (P.L.S., N.S.W., 1889, pp. 1243-4) Blanchard considers *hepatica*, Er., a synonym of *australis*, Guér., and I have not sufficient evidence before me to form a decided opinion as to whether he is right. Unfortunately he does not give his reasons for the determination which could not be of much value unless it was founded on an inspection of the types.

H. grandis. In the remarks on this species (Tr. R. Soc., S.A., 1900, p. 113, line 28) "1891" should be substituted for "1892."

DIAPHONIA.

D. seminigra, Kraatz. This seems to me to be identical with *D. Parryi*, Jans.; the latter is the older name. This synonymy has not (so far as I can ascertain) been noted before.

BUPRESTIDÆ.

STIGMODERA.

S. Pallas, sp. nov. Sat lata; sat nitida; colore variegata, capite prothoraceque cupreis, elytris stramineis (his fasciis cyaneis 3 ornatis,—1ª basali lata marginem lateralem antice

anguste attingenti in disco retrorsum extensa et in sutura producta, 2ª post-mediana sat lata, 3ª apicali cum 2ª in sutura anguste connexa), corpore subtus aureo-æneo, antennis pedibusque cyaneis (his viridi-micantibus); capite minus elongato, crebre fortiter punctulato, inter oculos profunde concavo, parte inter oculos retrorsum haud angustata; prothorace quam longior sesquilatiori, subgibbo (i.e. antice fortiter declivi), ut caput punctulato, lateribus a margine antico (hoc quam basis fere duplo angustiori) longe pone medium divergentibus (hinc ad basin fere rectis); elytris ad basin subrectis, ad apicem late rotundatis, striatis, interstitiis parum convexis punctulatis, lateribus postice crenulatis; corpore subtus crebre sat fortiter punctulato; unguiculis inermibus. Long., 8 l. lat., $3\frac{1}{2}$ l.

The three strongly contrasted colors of the upper surface (bright copper on the head and pronotum, pale yellow and cyaneous on the elytra) together with the unarmed apices of the elytra render this species easy to identify. It is not unlike *S. cupricollis*, Saund., but in that species the elytra are emarginate and spinose at the apex and there are three zones of yellow on the elytra,—in the present species only two (this is not a sexual difference), &c., &c. The cyaneous markings on the elytra are intricate and difficult to describe. The basal is of very transversely quadrate form and does not reach the lateral margin except very narrowly at the base; it extends backward about one-seventh of the length of the elytra but is triangularly produced about half as far again on the suture. The postmedian fascia (looked at with the apex of the elytra towards the observer) bears a rough resemblance to a tree, the trunk of which is represented by the connection on the suture of the postmedian fascia and the apical blotch. The apical blotch occupies about the apical one-eighth of the elytra, and its front margin is somewhat sinuous. The specimens before me are females.

Thursday Island (sent to me by Mr. French).

S. erubescens, sp. nov. Modice elongata; sat nitida; colore variegata, capite prothoraceque purpureo-violaceis (illo viridi-tincto), elytris in parte anteriori testaceo-brunneis in parte posteriori tertia sanguineis [his notulis cyaneis ornatis, —sc. basi summa sutura parte antica excepta (in hac colore cyaneo postice dilatato) et fascia subrecta mox pone medium sita (hac nec suturam nec marginem lateralem plane attingenti)], corpore subtus antice violaceo postice viridescenti, antennis pedibusque altero adspectu cyaneis altero viridibus; capite sat elongato, crebre minus fortiter (postice magis fortiter minus crebre) punctulato, inter oculos vix concavo, parte inter oculos retrorsum haud angustata; prothorace

quam longior ut 8 ad 5 latiori, ut capitis pars posterior punctulato, lateribus modice arcuatis (latitudine majori pone medium sita) angulos posticos versus subplanatis; elytris ad basin mediam leviter angulatim productis, ad apicem rotundatis, punctulato-striatis, interstitiis sat convexis sparsim punctulatis, lateribus postice haud crenulatis; corpore subtus sparsius minus fortiter punctulato; unguiculis inermibus. Long., 10 l.; lat., $3\frac{4}{5}$ l.

This species bears a certain resemblance to *S. rubricauda*, Saund., but differs from it *inter alia multa* by its glabrous head, differently colored head and prothorax, the presence of a well-defined transverse fascia immediately behind the middle of its elytra. The sanguineous coloring of the elytra occupies the portion behind the fascia. The cyaneous coloring of the suture begins a little in front of the middle and is narrow to the beginning of about the apical one-third of the elytra, where it dilates into an elongate oval blotch which reaches the apex and there is again dilated along the apical margin to nearly the width of its widest part.

Thursday Island (sent by Mr. French).

S. guttigera, sp. nov. Modice elongata; minus nitida; ænea, elytris flavo-testaceis (his ad basin anguste æneis, ad apicem violaceis, guttis sex sat parvis ornatis,—sc. duabus communibus et binis prope marginem lateralem positis), abdomine rufo-testaceo, antennis pedibusque violaceis viridimicantibus, scutello violaceo; capite modice elongato, crebre subfortiter sat æqualiter punctulato, longitudinaliter sat profunde concavo, parte inter oculos postice parum angustata; prothorace quam longior sesquilatiori, fere ut caput punctulato, lateribus pone medium manifeste dilatato-rotundatis, basi quam margo anticus ut 6 ad $3\frac{1}{2}$ latiori utrinque punctura foveiformi instructa; elytris ad basin mediam leviter angulatim productis, ad apicem anguste obsolete emarginatis vix bi-apiculatis, ad latera mox pone basin fortius emarginato-sinuatis, punctulato-striatis, interstitiis leviter convexis sat crebre minus subtiliter punctulatis, lateribus postice subtiliter crenulatis. Long., 8 l.; lat., $2\frac{3}{5}$ l.

In outline and sculpture this species closely resembles *S. Jekeli*, Saund., but it is much smaller, with very different markings and coloring, and with its prothorax notably less strongly transverse and less strongly dilatate-rotundate on the sides, and the foveiform puncture at the middle of the base of the pronotum (so conspicuous in *Jekeli*) is wanting.

Victoria.

CLERIDÆ.

ELASMOCERUS.

E. picticollis, sp. nov. Mas. Elongatus, sat parallelus; pube subtili erecta vestitus; niger vix ænescens, pronoti margine antico (parte mediana excepta) basique elytrorum marginis lateralis parte dimidia antica et abdomine rufo-testaceis; capite confertim rugulose, pronoto paullo minus crebre, elytris etiam minus crebre nec rugulose, minus subtiliter punctulatis; antennarum articulo apicali laminiformi quam ceteri conjuncti triplo longiori; prothorace subcylindrico quam latior sat longiori. Long., 3½ l.; lat., 1 l.

This genus has not been previously reported as Australian. It was founded on some American species with which African ones have since been associated. The antennæ of the male are very remarkable, and probably mimic those of some other insects on which *Elasmocerus* is parasitic,—perhaps *Longicorns* with flabellated antennæ.

Victoria.

TENEBRIONIDÆ.

CHALCOPTERUS.

C. cribratus, sp. nov. Late subovalis, sat brevis; minus nitidus; niger, elytris olivaceo-æneis; capite æqualiter crebre subtilius punctulato, oculorum interspatio quam antennarum articuli basalis longitudo vix latiori; sulcis ocularibus nullis; antennis quam corporis dimidium parum brevioribus, modice robustis, apicem versus perspicue incrassatis, articulo 3° quam 1us 2us que conjuncti manifeste longiori quam 4us 5us que conjuncti manifeste breviori; prothorace quam longior duplo (postice quam antice ut 5 ad 3) latiori, æqualiter crebre subtilius (quam caput paullo magis leviter) punctulato, antice leviter emarginato, a basi antrorsum (superne viso) arcuatim angustato, basi media perspicue minus late lobato, angulis anticis obtusis (sed bene definitis) posticis (superne visis) leviter obtusis (fere rectis); elytris nullo modo striatis, subæqualiter (apicem versus magis confertim) fere ut prothorax sed multo magis profunde punctulatis et puncturis manifeste majoribus seriatim instructis; prosterno medio leviter obtuse carinato; corpore subtus crebre leviter punctulato; femoribus anticis sparsim subtiliter punctulatis; tarsis nigro-setosis, posticorum articulo basali quam ceteri conjuncti vix breviori. Long., 5 l.; lat., 3 l.

In my tabulation of the genus *Chalcopterus* (P.L.S., N.S.W., 1893, pp. 56, &c.) this species falls beside *C. rugosipennis*, Macl., from which it is extremely distinct *inter alia* both in coloring and shape. Macleay's insect is "elongate-ovate" with elytra

"nearly three times as long as wide;" in the present species the elytra are much less than twice as long as wide. The elytral puncturation resembles that of *C. fastuosus*, Germ., but is coarser and sub-asperate with the seriate punctures more evidently larger than the punctures of the interstices. The prothorax, however, is that of the aggregate "E" (on p. 56) while that of *fastuosus* is of the aggregate "EEE" (on page 61).

Queensland.

ŒDEMERIDÆ.

PSEUDOLYCUS.

P. torridus, sp. nov. (Mas.) Elongatus, sat angustus; dense pubescens; ater, prothorace medio et elytris rufis, antennarum basi palpisque picescentibus; capite crebre subtilissime punctulato, antice fortiter elongato; antennarum articulis 3°—10° dilatatis (3° 4° que inter se sat æqualibus, 5° quam 4us paullo breviori vix angustiori, 5°—10° gradatim angustioribus, 4° quam 10us plus quam duplo latiori; prothorace subcylindrico, supra subtilissime punctulato, indeterminate inæquali (certo adspectu prope angulos omnes tumido), lateribus manifeste arcuatis; elytris fortiter 4-costatis. Long., $4\frac{1}{2}$ l.; lat., $1\frac{1}{5}$. l. (vix).

A very distinct species. In my tabulation of the genus (Tr. R. Soc., S.A., 1899, p. 85) it falls at the end, thus,—

AAA. Pronotum not having a median ridge that becomes bifid in its hinder part. Joints 3—11 of the antennæ entirely black .. .. *torridus*, Blackb.

Apart from color this species differs from those (previously described) not having on their pronotum a central ridge diverging hindward in two branches in its hind part, *inter alia* by the much stronger costæ of its elytra.

Queensland.

CURCULIONIDÆ.

EUTHYPHASIS.

E. funerea, sp. nov. Picea, pube fusco-cinerea (hac notulis pallide cinereis et nigris variegata) dense vestita, antennis pedibusque obscure ferrugineis, corpore subtus ferrugineo (in sternis obscuriori); rostro quam latiori fere duplo longiori, sat depresso; prothorace quam latior multo longiori, antice subtubuliformi; hoc cum capite confertim subrugulose subtilius punctulato; elytris punctulato-striatis, ad apicem modice producto-elongatis, interstitiis nonnullis leviter costiformibus. Long., $3\frac{2}{5}$ l.; lat., $\frac{1}{2}$ l.

The black pubescence forms a quadrate patch on each elytron placed somewhat obliquely and considerably behind the middle. The pubescence of lightest color is on the sides of the pronotum

and immediately before and behind the black elytral patch. The general pubescence of the head and pronotum is evidently darker than that of the elytra. This species differs entirely from its previously described congeners in colors and pattern (in these respects it is remarkably like *Ophthalmorychus angustus*, Blackb.). It differs structurally from *E. parva*, Blackb., *inter alia* by its prothorax distinctly (though not strongly) tubuliform in front, its elytra less produced at the apex, its much denser pubescence, and the manifestly subcostiform appearance of some of its elytral interstices.

Victoria (Dividing Range).

MANDALOTUS.

M. crudus, Er. This species is very well described by its author and there is little which an inspection of the type calls for by way of addition, although a considerable number of congeneric species have since been described. It is at once distinguishable from all the *Mandaloti* known to me (and, I think, from the few I do not know) by the sculpture of its elytra which (owing to the presence of numerous obtuse feebly elevated ridges forming a kind of reticulation) presents an areolate appearance somewhat suggestive of the elytral sculpture of the *Colydiid Meryx areolata*, Pasc.,—though the areolation is less sharply defined than in that insect. The type is a male, the mesosternal projection being very decidedly of the form of a blunt spine (as described by Erichson) and therefore very different from that of *M. hoplostethus* (also from Tasmania). To Erichson's description of the hind tibiæ it should be added that at the middle of the inner margin (immediately before the commencement of the curvature of the outline) there is a strong transverse carina which from some points of view looks like a prominent tooth.

M. rigidus, Er. This is certainly the female of *M. crudus*. It has exactly similar elytral sculpture, but differs in being somewhat wider and more robust in form, with the mesosternal spine replaced by a feeble tubercle and the tibia presenting the differences that usually distinguish those of female *Mandaloti* from their males.

M. sterilis, Er. The type of this species is probably a male, but with very feeble sexual characters. I should say that it is identical with *M.* (*Dysostines*) *fuligineus*, Pasc. (judging by the description of that insect). It is distinguishable from all the other *Mandaloti* known to me by its narrow elongate form. The carination of the alternate interstices of its elytra is well defined,—the white spot at the base of the third interstice (mentioned by Erichson) very indistinct. The mesosternum and tibiæ

are as described by Erichson except that the hind tibiæ are more strongly sinuate on their inner outline than I should understand by the term "*subrectæ*" and it should be added that the hind tibiæ are decidedly incrassate,—no doubt a sexual character, also that the suture between the first and second ventral segments is extremely fine and the segments themselves on the same plane.

M. vetulus, Er. I feel no doubt of this being the female of *M. sterilis*. It differs from it (as *rigidus* does from *crudus*) in being of somewhat wider and stouter build with the tibiæ considerably more slender and evidently less sinuate on their inner outline. The elytra have their alternate interstices distinctly elevated. The elytral markings mentioned by Erichson as present in *vetulus* are very feebly defined and to my thinking merely indicative of freshness of condition in the specimen; I attach no specific importance to them.

PERPERUS.

P. (*Nothrodes*) *languidus*, Er. Erichson's generic name is (as noted by Lacordaire) a synonym of *Perperus*. The species is very well described by its author. I cannot separate it from a species of which I have examples from N.S. Wales and Gippsland, which Mr. Lea has sent to me as *insularis*, Schönh., but which I believe to be *innocuus*, Schönh. Unfortunately most of the pubescence is gone from the type specimen of languidus (e.g. the four vittæ described as marking the pronotum), so that it is perhaps not justifiable to say positively that it is identical with *innocuus*, but I can find no structural character on which to separate it. The species that I take to be *insularis*, Schönh, has a broad white lateral elytral vitta, the humeral angles of the elytra much better defined and the elytral interstices less flat,—all of them characters referred to by Schönherr in his description.

P. convexipennis, sp. nov. Piceus, squamis cinereis et fuscis intermixtis vestitus; rostro quam prothorax parum breviori, supra vix manifeste carinato, ad apicem modice dilatato; antennis piceo-ferrugineis, funiculi articulo 2° maris basali sat æquali (feminæ paullo longiori); prothorace quam longior maris haud (feminæ manifeste) latiori, ad latera sat rotundato, supra sat crasse (nec profunde nec confertim) punctulato, fusco-trivittato; elytris fortiter convexis, sat fortiter punctulato-striatis, sutura et interstitiis alternis quam interstitia alia magis convexa, postice fortiter (maris minus fortiter) declivibus; corpore subtus subargenteo-squamoso. Long. (rostr. excl.), $3\frac{3}{5}$ l.; lat., $1\frac{1}{6}$—$1\frac{3}{5}$ l.

Notable for its extremely convex elytra. Looked at from the side the prothorax appears only half as high as the elytra *P. urticarum*, Pasc., approaches it in form but there is consider-

ably *less* difference between its prothorax and elytra in height (viewed from the side). Also in *urticarum* the eyes are less widely separated from each other and the elytral interstices are equal (or nearly so). The other species have their elytral interstices equal.

N.S.W. (Maitland, &c. Mr. Froggatt calls it a vine pest).

ETHADOMORPHA (gen. nov. *Erirhinarum*).

Corpus plus minusve squamosum; rostrum (? utriusque sexus) gracillimum valde elongatum (speciei typicæ quam prothorax sat longius) arcuatum; scrobes præmedianæ, oblique sub rostrum vergentes; antennæ minus elongatæ, scapo oculum haud plane attingenti, funiculo 7-articulato (articulis basali sat robusto sat elongato, ceteris parvis inter se subæqualibus, apicalibus 3 gradatim paullo dilatatis); oculi ovales grosse granulati; prothorax transversus, antice breviter subtubuliformis, lobis ocularibus nullis, lateribus leviter arcuatis, basi subrecta; scutellum minimum; elytra quam prothorax sat latiora; prosternum antice sat emarginatum, ante coxas minus elongatum, longitudinaliter nullo modo concavo; coxæ anticæ fere (sed haud plane) contiguæ; femora inermia; tibiæ anticæ intus ad apicem breviter mucronatæ; tarsi breves sat lati (articulis 3° bilobo, 4° 3um haud superanti); unguiculi minutissimi simplices; segmenta ventralia basalia 2 inter se sat æqualia, 3° 4° que brevissimis.

The very small *Erirhinid* for which I propose this name cannot be referred to any hitherto characterised genus. Its most distinctive feature is in its tarsi which are short and broad, not very unlike those of a *Misophrice* but with a minute claw joint (in the emargination of the third joint) ending in two very small simple divergent claws. In my tabulation of the *Erirhinid* genera of Australia this one falls besides *Omorophius* (Tr. R.S., S.A., 1894, p. 149), from which it is distinguished as follows:—

NN. Ocular lobes wanting.
- O. Apical joint of tarsi well developed .. ... *Omorophius*
- OO. Apical joint of tarsi very minute and not passing third joint ... ... *Ethadomorpha*

It does not resemble *Omorophius* superficially, but has the facies of *Ethas* which however has the fourth tarsal joint normally developed, the prothorax with ocular lobes, &c. Its tarsal structure is nearest to that of *Niphobolus* (of known genera), but that genus has considerably larger claws and very different rostral and antennal characters. The apical mucro of the front tibiæ is very small and little noticeable but I think I am right as to its presence,—though in so minute an insect it is difficult to be quite certain without breaking a specimen.

E. clauda, sp. nov. Nigro picea, pube albida maculatim minus perspicue vestita; rostro capite et pronoto crebre subtilius subaspere punctulatis; elytris subfortiter punctulato-striatis, interstitiis manifeste elevatis subtiliter coriaceis. Long. (rostr. excl.), 1 l. (vix); lat., $\frac{3}{10}$ l.

Victoria (Dividing Range).

CRYPTORRHYNCHUS.

I have before me the types of two species which Erichson referred to this genus.

As Mr. Lea is at present engaged on a Revision of the *Cryptorrhynchides* it would be inopportune for me at the present moment to propose any new names for members of that group. I therefore merely supply the following notes.

C. solidus, Er. A new generic name will be required for this species (and another in my collection evidently congeneric with it). Its very short metasternum *inter alia multa* is inconsistent with its standing in *Cryptorrhynchus*. Its generic characters are as follows:—Pectoral canal ending in the mesosternum and cavernous at apex; pronotum not distinct from the flanks of the prosternum; scape of antennæ reaching (or very nearly so) the front of the eye; tibiæ unarmed externally; hind femora not abnormally dilated; third tarsal joint dilated and bilobed; metasternum very short, its episterna distinct; second ventral segment a little shorter than third and fourth together; scutellum very well defined; first ventral suture enfeebled in the middle; femora feebly toothed beneath. Its specific characters are well described by its author.

C. infulatus, Er. Distinct from *Cryptorrhynchus* by *inter alia* its short pectoral canal, which does not reach back so far as to the level of the front of the intermediate coxæ. Its structural characters are as follows:—Similar to the preceding (*C. solidus*) in respect of the first six characters attributed (above) to it:—metasternum moderately elongate, about same length as the basal ventral segment; claw joint not clothed with large erect scales; tibiæ not longitudinally ribbed (as they are in *Tyrtæosus*); femora not (or but feebly) sulcate beneath; eyes strongly and not particularly finely granulate; pectoral canal comparatively short and wide; all the femora armed beneath with a single tooth, which is placed at or about the middle; under surface of all the femora much depressed though scarcely sulcate; elytra tuberculate and fasciculate; rostrum considerably flattened above in all its length; second ventral segment much shorter than the first and shorter than the third and fourth together. Erichson's description of the specific characters is a good one.

ACALLES.

A. rubetra, Er. The type of this species differs from European species of *Acalles* (*e.g.*, *roboris*, Curtis) *inter alia* by its hind femora being very strongly and suddenly claviform in their apical portion, the dilatation entirely on the upper outline. Its general characters are as follows :—Similar to *Crypt. solidus* in respect of the first four characters attributed above to that species—third tarsal joint dilated and bilobed; metasterum very short, its epimera not distinctly visible; femora unarmed, somewhat sulcate or at least flattened beneath (not evenly convex as in *Poropterus*); the basal two ventral segments with a strong common longitudinal median sulcus in which the first ventral suture is effaced; pectoral canal not quite reaching back to the level of the front part of the intermediate coxæ; elytra tuberculate; scutellum invisible.

ANTHRIBIDÆ.

CACEPHATUS.

C. sericeus, Blackb. This species was taken in Victoria. The record of the place of capture was omitted when the insect was described (T.R.S., S.A., 1900, p. 152).

TROPIDERES.

T. musivus, Er. I have the type of this species before me. There is no need to add anything to its author's excellent descrip. tion from a specific point of view. I do not think, however, that it can stand as a *Tropideres*, *inter alia* on account of its antennæ so long as to reach the base of the elytra and its small widely separated eyes. In my tabulation of the genera of Australian *Anthribidæ* (Tr. R.S., S.A., 1900, p. 143) it stands beside *Cacephatus*,—its antennæ however being *scarcely* longer than the head and prothorax together. I cannot, however, refer it to that genus on account of its depressed form, its anterior coxæ quite widely separated from each other, its eyes comparatively small and widely separated from each other, and its much longer and narrower rostrum not forming with the head a continuous plane surface. Its depressed form and style of markings are very suggestive of my *Entromus dorsoplagiatus* with which (*loc. cit.*) I conjectured that it might be congeneric; but *inter alia multa* its entirely different antennæ and rostral scrobes show that conjecture to have been very wide of the mark. I regard it as the type of an undescribed genus.

LONGICORNES.

PHACODES.

P. modicus, sp. nov. Subelongatus; sat robustus; obscure ferrugineus, piceo - variegatus, antennis (articulorum apice

excepto) palpis coxis pedibusque rufescentibus; pube grisea et fusca intermixta vestitus; prothorace quam longior vix latiori, crebre aspere punctulato, carina longitudinali mediana interrupta et tuberculis opacis discoidalibus nonnullis instructo, antice quam postice haud angustiori, lateribus leviter arcuatis; elytris inæqualiter punctulatis, sparsim granuliferis (granulis a basi retrorsum gradatim minoribus), ad apicem fortiter emarginatis; antennarum articulis 3°—5° ad apicem breviter spiniferis, 3° quam 1us manifeste (quam 4us multo) longiori.

Maris antennis quam corpus vix (feminæ manifeste) brevioribus. Long., 8—9 l.; lat., $2\frac{3}{5}$ l.

The pubescence of the head and pronotum is of a somewhat uniform fuscous color with a tendency to be paler on the sides and tubercles of the latter. The derm itself of the elytra is variegated being in general dull reddish but with an interrupted blackish vitta on a wide feebly elevated longitudinal space traversing the disc. The blackish parts of the elytra are glabrous or nearly so; the reddish parts are clothed (neither very closely nor very evenly) with pale brownish pubescence; the evenness of the pubescence is also much interrupted by the granules and punctures of the elytra. The punctures of the elytra vary greatly in size some of them being very large and coarse. The previously described species of *Phacodes* having the apex of the elytra emarginate are *bella*, Blackb., and *tenuitarsis*, Pasc.; of these the former *inter alia* has the basal part of the elytra very much more strongly and closely granuliferous; the latter is much smaller, with joints 3 and 4 of the antennæ almost equal.

N.W. Australia (Masters).

NOTOCERESIUM (gen. nov. *Callidiopsidarum ?*)

Mas. Palpi maxillares sat elongati, articulo ultimo sat elongato vix triangulari; palpi labiales brevissimi; caput transversum subrotundatum, antice sat fortiter declive, pone oculos subite angustatum; antennæ quam corpus multo longiores, articulis 1° 5° que inter se sat æqualibus, 3° quam 5us et 4° quam 3us paullo brevioribus; oculi fortiter granulati, intus sat fortiter emarginati, inter se latissime remoti; prothorax fortiter transversus, supra æqualis, antice et postice sat æqualiter angustatus, lateribus ad medium angulatis et tuberculo minuto armatis (hinc antice et postice recte convergentibus); scutellum modicum; elytra valde elongata sat parallela, postice inermia; pedes sat elongati, femoribus sat compressis leviter clavatis (posticis abdominis apicem nullo modo attingentibus), tarsorum posticorum articulo basali quam 2us 3us que conjuncti paullo longiori; coxæ antice

contiguæ prominentes, ad latera paullo angulatæ; mesosterni epimeris coxas intermedias haud attingentibus; corpus elongatum sat parallelum, sat glabrum.

This is one of the most anomalous Longicorns I have seen. It will not fit into any of M. Lacordaire's "Groupe's" satisfactorily but I think it is best regarded as an aberrant *Callidiopsid*. It is certainly a "*Cerambycid vrai*" (according to Lacordaire's classification) and its strongly granulated eyes place it in the first "section" of that aggregate. The epimera of its mesosternum not nearly reaching the intermediate coxæ, its very short head widely transverse and as broad as the prothorax, non-spinose antennæ, non-carinate tibiæ, the even surface of its elytra, and its very inconspicuous antenniferous tubercles refer it, without any hesitation, in the tabulation of that aggregate, to the groupe *Callidiopsides;* but the form of its front coxæ is very different from the form of those organs in any previously described *Callidiopsid* known to me. It is true that Lacordaire mentions a tendency to abnormal prominence of the front coxæ in *Diatomocephala*, &c., which he nevertheless places in the "groupe" in question, but in the present insect the coxæ are much more prominent than in *Diatomocephala* and moreover are contiguous.

N. impressiceps, sp. nov. Mas. Elongatum, sat angustum, parallelum; sat nitidum; testaceo-brunneum, elytris nonnihil obscurioribus; sat glabrum, capite quam prothorax haud angustiori, inter oculos lato sat plano, linea longitudinali mediana fortiter impresso, sparsim leviter sed vix subtiliter punctulato, clypeo a fronte sutura manifesta diviso; pronoto ut caput punctulato, æquali; elytris quam prothorax parum latioribus, puncturis sat parvis crebre fortiter impressis; corpore subtus sparsim inæqualiter punctulato. Long., 2—3 l.; lat., $\frac{1}{2}$—$\frac{2}{3}$ l.

Tasmania (Lake District).

OPSIDOTA.

O. sculpticollis, sp. nov. Rufo-fusca, pilis griseis (in elytris pedibusque sparsim, in ceteris partibus sat dense) vestita; capite quam *O. albipilosæ*, Pasc., paullo minus brevi, sat inæquali, crebrius subtilius punctulato; antennis quam corpus paullo longioribus, articulis (basalibus 2 exceptis) manifeste compressis apicali appendiculato; prothorace leviter transverso, supra vermiculato-ruguloso sed areis minus concinne definitis subconvexis lævibus nitidis ornatis, lateribus subrectis, latitudine majori prope apicem sita; elytris lineis vix elevatis 2 minus perspicue instructis, basin versus crebre subrugulose sat fortiter (hinc retrorsum

gradatim minus fortiter minus rugulose,—apicem versus sublævibus) punctulatis; tarsis sat latis (ut *O. albipilosæ*, Pasc.). Long., $9\frac{1}{2}$—$11\frac{1}{2}$ l.; lat., $2\frac{1}{2}$—$2\frac{4}{5}$ l.

The basal joint of the antennæ is quite as strongly arched as in *O. albipilosa*, the first, third, and fourth joints about equal in length, the following joints longer. The nitid spaces on the pronotum are a wide median continuous vitta, a round spot on either side close to the front, and a basal fascia (ill developed) which is conspicuously produced forward and obliquely outward to the front margin but becoming ill-developed in front. This species can be at once distinguished from all the previously described *Opsidotæ* by, *inter alia*, the large and conspicuous nitid spaces on its pronotum. I am uncertain of the sex of the two specimens before me but I judge them to be males from the strong appendiculation of the apical joint of their antennæ and the shortness of their apical ventral segment. The antennæ are less strongly compressed than in the male of *albipilosa* and the head is not quite so short as in that species, but it is very much shorter than in *Strongylurus*.

N. Queensland (Port Mackay; sent by Mr. French).

PROSOPLUS.

P. (*Niphona*) *torosa*, Pasc. There is a specimen from N.W. Australia in the S. Australian Museum agreeing so well with the description of this species that I cannot doubt its identity. Mr. Pascoe gives "S. Australia" as the habitat. I have never, however, seen an example taken in S.A., nor do I know of any *Coleoptera* (except some well-known to be found all over Australia) common to S.A. and N.W.A. I suspect therefore that Pascoe's statement of habitat is incorrect unless it designates "the Northern Territory" under the term "South Australia."

ANCITA.

A. dispar, sp. nov. Picea, tomento cinereo ochraceo et fusco variegata, labro antennis pedibusque plus minusve rufescentibus; capite prothoraceque dense subgranulose punctulatis; hoc ante medium transversim sulcato, utrinque in dorso sat fortiter gibboso et ad latus tuberculo magno acuto armato, linea mediana plus minusve impressa et granulis magnis nitidis nonnullis instructo; elytris costulis discoidalibus binis tuberculis binis parvis anticis (his oblique paullo pone basin positis) et tuberculis 4 vel 5 posticis (his transversim sat longe pone medium positis) ornatis, fortiter sat crebre punctulatis; antennis 11-articulatis.

Maris antennis quam corpus sat longioribus, feminæ elytrorum apicem vix attingentibus. Long., $5\frac{3}{5}$—$6\frac{1}{2}$ l.; lat., $2\frac{1}{3}$—3 l.

This species is easily recognisable by the arrangement of the

tubercles on its elytra. A small conical and very conspicuous tubercle stands just within and behind the humeral callus, and there is another similar to it between it and the suture but further from the base of the elytra. At the summit of the hind declivity of each elytron is a transverse row of four or five tubercles, which in the two females before me (one of which I regard as the type of the species) are similar to the subbasal tubercles, but in the unique male (attributable I think to this species) are much smaller.

The disposition of the variegated pubescence is very intricate and difficult to describe. It produces the following arrangement of colors;—the head is dark fuscous with the cheeks and a broad stripe down the middle whitish; the pronotum is of a more or less pale brown with on either side of the middle line a large dark brown subbasal blotch edged externally by some very pale pubescence. The elytra in the two females are intricately mottled with dark and pale brown,—the latter in one of them *very* pale, in the other strongly ochraceous. In the male example the external portions of the elytra are mottled as in the female while the rest of their surface is almost entirely ochraceous. The undersurface and legs are of ashy color thickly peppered with small black spots. Joints 3—7 of the antennæ are whitish except near the apex (much more conspicuously in the male than in the female), and the close and somewhat elongate hairs fringing the antennæ beneath are of the color of the pubescence from which they spring.

It is just possible that this insect is *A. crossotoides*, Thoms., but the description under that name is too slight for confident identification, and moreover (even such as it is) does not agree with the present species. It describes the elytra as having four fasciæ of black pilosity and also some black tubercles. If these four fasciæ be taken as "two on each elytron" their number would seem to suggest the idea of their referring to the series of tubercles mentioned above as present in this insect, but in that case their color does not agree, nor can I find any way of counting the tubercles so as to make four transverse rows *and* some tubercles besides.

N.W. Australia.

A. didyma, sp. nov, Nigricans, tomento griseo ochraceo et nigricanti variegata, labro testaceo, antennis pedibusque picescentibus; capite prothoraceque dense subgranulose punctulatis; hoc ante medium transversim sulcato, utrinque in dorso sat fortiter gibboso et ad latus tuberculo magno acuto armato; elytris inæqualibus (sc. puncturarum interstitiis irregulariter elevatis, certo adspectu lineas varie dispositas formantibus), basin versus cristas binas (altera

oblique, altera sat transversim, posita) pone medium lineam fortiter contortam (hac quam lineæ ceteræ magis perspicua) ferentibus, fortiter sat crebre punctulatis; antennis 12-articulatis.

Maris antennis quam corpus multo (feminæ paullo) longioribus.

Long., 5—7 l.; lat., 2—3 l.

Distinct from previously described species by *inter alia* the rugulosities of the elytra. These organs present an unusually coarse appearance owing to the interstices of the punctures being much raised and here and there running together into transverse or oblique wrinkles among which the longitudinal costulæ (usual in the genus) are little apparent. Within and behind the humeral callus is an oblique crest; close to it but not touching it (and nearer to the suture) is another similar one placed more transversely. These crests are not pilose and have a sharply carina-like contour. About the summit of the posterior declivity an elevated line leaves the suture and runs obliquely forward and away from the suture till it reaches the inner one of the longitudinal costulæ where it turns at a sharp angle and runs obliquely hindward a short distance and then turning again runs obliquely forward to the external one of the longitudinal in which it loses itself. These crests and lines are blackish and form the darkest part of the elytra. There are no defined pubescent markings on the upper surface, pale and dark pubescence (with a preponderance of the latter) shading off into each other in a variable manner. The under-surface and legs are piceous more or less reticulated with pale pubescence. Joints 3—12 of the antennæ are cinereo-pubescent at the base with the apex dark (successively less widely dark, joint by joint).

N.W. Australia.

ZYGOCERA.

Z. concinna, sp. nov. Nigro-picea, labro palpisque testaceis; pube cinerea nigraque variegata, hac fasciam postmedianam flexuosam formanti; capite cinereo-villoso, postice nigro-4-maculato; antennis quam corpus multo longioribus, articulo 3° quam 1us 2 que conjuncti paullo longiori, articulis 3° ad apicem et 4°—11° ad basin apicemque albidis; oculorum lobo inferiori fere ut *Z. bifasciatæ*, Pasc. (i.e., sat magno sat late ovali minus oblique posito) sed paullo magis subtiliter granulato; prothorace transversim trisulcato, haud nigro-lineato sed maculis nonnullis nigris ornato, fortiter transverso, utrinque ante basin tuberculo sat conspicuo et ad latus tuberculo magno acuto (quam *Z. bifasciatæ* majori magis acuto) armato; elytris ad basin tuberculo sat magno nigro armatis, in disco manifeste bicostulatis, ad apicem emarginatis et bispinosis, cinereo-pubescentibus, pube nigra macu-

latim vix seriatim (et pone medium fasciatim) variegatis; pedibus cinereo-pubescentibus, nigro variegatis (præsertim posticis); sternis ut *Z. bifasciatæ* conformatis; segmentis ventralibus cinereo-pubescentibus, in medio et utrinque maculatim nudis. Long., 6 l.; lat., $2\frac{1}{8}$ l.

This species differs *inter alia* from those previously described as follows; from *metallica*, Westw., and *pruinosa*, Boisd., by the presence of transverse impressed lines on the pronotum, from *bifasciata*, Pasc., by the presence of basal tubercles on the elytra, from *luctuosa*, Pasc., and *plumifera*, Pasc., by the elytral tubercles not being clothed with long soft pale pilosity, from *lugubris*, Pasc., *cuneata*, Pasc., and *Mastersi*, Pasc., by the presence of dorsal tubercles on the pronotum, from *pentheoides*, Pasc., by the emargination of the apex of the elytra, from *pumila*, Pasc., by the very large and acute lateral tubercles of its prothorax. *Z. canosa*, Er., is very differently colored, and has very different markings (if I am right in my identification of *Z. canosa* with a species I collected in Tasmania it differs also in structure,—e.g., the form of the prosternum). I have not seen the description of *Z. niveosignata*, Jord., but the name would be an impossible one for the present species, which has no white markings on either its upper or under surface. As I am not certain of my identification of some of Pascoe's species being correct I have not mentioned, in distinguishing the present species from them, any of their characters that are not mentioned in their descriptions. I am doubtful as to the sex of the type. I may mention here that valuable specific characters in the *Zygoceræ* (not mentioned by Pasc.) are to be found in the structure of the eyes and of the sterna.

N.W. Australia; sent to me by Mr. Masters.

Z. bifasciata, Pasc. Mr. Masters has sent me a specimen taken in N. Queensland in which the ante-median dark fascia of the elytra is wanting, but which in other respects seems to be identical with *Z. bifasciata*.

PENTHEA.

P. tigrina, sp. nov. Fem. Robusta; pube albida ochraceaque maculatim et vermiculatim variegata; capite supra sat convexo-elevato, subtilius sparsissime punctulato, longitudinaliter impresso, clypeo antice lato truncato; tuberibus antennariis (ut *P. sannionis*, Newm.) magnis prominulis subapproximatis; antennis quam corporis dimidium paullo longioribus, subtus disperse ciliatis, articulis 3°—9° basin versus niveo-pubescentibus, articulo 3° quam 1us et quam 4us parum longiori; oculis ut *P. sannionis* granulatised multo minoribus; prothorace fortiter (quam *P. sannionis* multo magis) transverso, fortiter granulatim et transversim

ruguloso, ad latera 4-gibbosis (gibbis medianis 2 quam ceteræ multo majoribus); elytris 3-costatis (costis plus minusve granula conjuncta simulantibus), inter costas granulis (his inter se magnitudine valde diversis) in parte basali dimidia ornatis, ad apicem rotundatis vel vix subtruncatis. Long., 11—12½ l.; lat., 4—4½ l.

The pubescence of the upper surface is almost identical with that of *P. Saundersi*, Pasc., except in nearly all the pubescent patches being (instead of entirely white) white variegated with bright ochraceous colour, and there being an irregular space behind the middle on which there is very little pubescence, so that an ill defined dark fascia (interrupted or nearly so at the suture) can be traced. The under surface and legs are very uniformly mottled with black and white much as in *P. intricata*, Pasc., but with the black spaces larger and more conspicuous.

This species differs from those resembling it in colour, size and style of marking as follows, *inter alia*;—from *costata*, Pasc. (according to description,—I am not sure that I know the insect), by the ochreous colour of the markings of the upper surface and by the markings on the elytra being vermiculate (as in *Saundersi*, Pasc.) in form,—no continuous pubescence along the sides or elsewhere;—from *Saundersi* by its differently coloured pubescence and non-rugulose head;—from *intricata*, Pasc., by its antennal tubers much larger and more prominent and placed nearer to each other and by the very much larger and more numerous granules of its elytra,—from *solida*, Pasc., by the granulate character of its elytral costæ,—from *vermicularia*, Don., by the ochreous colour of its pubescence, the very much stronger prominences on its prothoracic lateral outline, &c., &c.

W. Australia (Coolgardie; Mr. French).

SYMPHYLETES.

S. lentus, sp. nov. Sat elongatus, sat parallelus; piceus; pube pallide fulva dense vestitus, hac pube magis ochracea vix perspicue marmorata, pube latera versus plus minusve dilutiori, pedibus antennisque pube pallida indistincte variegata; capite haud convexo-elevato, linea longitudinali subtili impresso, clypeo antice sinuato; oculis modicis (quam *S. nodosi*, Newm., paullo magis convexis paullo magis fortiter granulatis); antennis quam corpus paullo brevioribus (maris quam feminæ parum magis elongatis), subtus modice ciliatis; prothorace sat fortiter transverso, tuberculis parvis 2 medianis in disco transversim positis (his inter se sat remotis) et 2 basin versus inter se approximatis instructo, margine laterali inæquali (quasi 2 vel 3 tuberculato); elytris sat æqualibus, longitudinaliter 3-seriatim granulatis (seriebus, externa ultra medium continua, ceteris gradatim brevioribus), ad apicem rotundato-subtruncatis et dense pilosis.

Maris segmento ventrali 2° antice area transversim parallela segmentum medium haud attingenti dense pilosa instructo. Long., 7—9 l.; lat., 2¼—3 l.

An extremely uniformly coloured species appearing to a casual glance of a continuous pale fulvous tone everywhere except that the elytra are gradually and more or less distinctly paler towards the sides (in one example almost whitish at the palest part), the pale colouring being usually somewhat dilated inward in a subtriangular form slightly in front of the middle. The pubescence is extremely close entirely concealing the derm everywhere and when closely examined is seen to be closely mottled with two slightly different shades,—one nearly pure brown, the other more reddish. Distinctive characters are (*a*) the tubercles,—or rather granules scarcely larger than those of the elytra,—on the pronotum (two widely separated and placed transversely on the middle of the disc and two similar ones placed transversely close together considerably behind the other pair, also several on the lateral outline); (*b*) the regular longitudinal rows of granules on the elytra,—the subsutural row very short, the next longer, the external row passing the middle of the elytra,—these granules being glabrous; (*c*) the antennæ shorter than the body in both sexes; (*d*) the unusual form of the pubescent area on the (apparently) second ventral segment of the male which appears like a mere transverse band of pilosity not nearly reaching the middle of the segment,—its hind margin straight. The apex of the elytra is so densely pilose that it is difficult to be sure of its shape; and from one point of view it seems to be rounded, from another feebly truncate.

I cannot make this species fit the description of any of Mr. Pascoe's species of *Symphyletes*, but they are so brief and vague that certainty is scarcely possible. The species that seem to be most like it, however, have elytra either crested or spinose at the base, or at the apex very different from those of the present insect.

N.W. Australia (in S.A. Museum; also sent by Mr. Masters).

S. fasciatus, sp. nov. Sat robustus; piceus, pube cinerea et ochrea sat dense (sed in elytrorum partibus basalibus et apicalibus sparsim maculatim) vestitus, pedibus rufis; capite haud convexo-elevato, linea nigra longitudinali impresso, sparsim punctulato, clypeo antice truncato; oculis sat magnis (quam *S. nodosi*, Newm., perspicue majoribus); antennis subtus sat dense ciliatis; prothorace inæquali (pone apicem transversim late concavo, in disco medio tuberculis parvis 2—his linea subtili connexis—et postice inque lateribus tuberculis subobsoletis nonnullis munito); elytris in parte dimidia antica subseriatim granuliferis sed haud cristatis, sat crebre minus

fortiter punctulatis, ad apicem fortiter emarginatis et bispinosis.

Maris antennis quam corpus sublongioribus, articulo apicali curvato-appendiculato; segmento ventrali basali ad apicem et segmenti 2[i] area angusta basali subparallela (hac segmentum medium haud attingenti) dense ochreo-pilosis.

Feminæ antennis quam corpus brevioribus, articulo ultimo vix appendiculato. Long., 12 l.; lat., 4 l.

Over the whole surface except the elytra there is an even clothing of ashy pubescence vaguely intermingled with ochreous. The antennæ are clothed with ashy fine pubescence the joints beyond the second having their apices (successively less widely) glabrous. The elytra are pubescent across the base to about the distance of the apex of the scutellum; then comes a nearly glabrous zone bearing only a few small pubescent spots and reaching back to about the apex of the basal one-fifth of the elytra; the next zone is densely pubescent (nitid granules however protruding through the pubescence and a somewhat triangular subglabrous space interrupting the pubescence on the lateral margin), its front margin being nearly straight, its hind margin strongly concave; the apical zone (not much less in length than half the elytra measured on the suture, and about one-third measured on the lateral margin) is sparsely studded with small pubescent spots on the almost glabrous derm.

The pubescent variegation of the elytra is much like that in *S. cinnamomeus*, Pasc., and *Rhytiphora latifasciatus*, Pasc.,—from the first of which this species differs *inter alia* by the elytra not being crested at the base and from the other—independently of generic characters—by the deeply emarginate and biapiculate apex of each elytron. If I am correct in my identification of the two species just mentioned they also differ from *S. fasciatus* in their sexual characters.

N. Queensland; sent by Mr. French from Port Mackay.

RHYTIPHORA.

S. uniformis, sp. nov. Fem. Minus elongata; sat parallela; picea plus minusve rufescens, antennis palpis pedibusque manifeste rufescentibus; pube albido-cinerea dense vestita, hac (? exemplis abrasis) in partibus nonnullis carenti sicut maculæ glabræ apparent; capite sparsim subtilius punctulato, supra sat elevato-convexo (fere ut *R. latifasciatæ*, Pasc.), linea longitudinali impresso, clypeo antice angusto triangulariter emarginato; oculis modicis sat fortiter granulatis (fere ut *R. latifasciatæ*); antennis quam corpus sublongioribus, plus minusve pube albida subtili vestitis, subtus pilis sat elongatis sat dense fimbriatis, articulo 3° quam 1[us] fere

duplo longiori; prothorace sat cylindrico, ut caput punctulato, subtiliter transversim rugato, lateribus apicem versus tuberculo armatis; elytris ad apicem truncatis, antice granulis sat numerosis instructis, postice puncturis sparsis impressis. Long., $8\frac{1}{2}$—9 l.; lat., $2\frac{3}{5}$ l.

I have two specimens of this insect before me. It is distinguishable from most of its congeners by its pubescent clothing being all but entirely of a pale ashy colour (the only variegation consisting in a faintly ochreous tone on some parts of the sterna). Probably in a perfectly fresh specimen this pubescence covers the derm everywhere except where it is interrupted by small granules and small sparse punctures. In both the examples before me, however, the humeral region of the elytra and some blotches somewhat behind the middle of the elytra are more or less denuded, but I suspect that this is due to abrasion. Another very distinctive character consists in the form of the clypeus the front of which is much narrowed, its apex being less than half the width of the interval between the lower lobes of the eyes, and being triangularly emarginate,—the sides of the emargination acute. I do not think there is any other intelligibly described species combining the characters of *Rhytiphora* (e.g., head strongly convex above the antennal tubers, eyes not finely granulated) with a clypeus of the form just specified, the basal part of the elytra (as in *R. latifasciata*, Pasc.) without any basal crest or other conspicuous elevation, vestiture of a uniform colour and antennæ strongly and thickly (even more so than in *R. Argus*, Pasc.) fringed beneath with pilosity.

N.W. Australia.

R. Simsoni, sp. nov. Robusta; ferruginea vel rufopicea, antennis (articulo basali excepto) obscurioribus; pube cinerea fulvaque variegata; capite sparsim subobsolete punctulato (sed juxta oculorum lobum superiorem puncturis nonnullis profundis impresso), linea mediana longitudinali impresso, supra sat elevato-convexo (fere ut *R. latifasciatæ*, Pasc.), clypeo antice lato truncato; oculis modice granulatis (quam *R. latifasciatæ* minus fortiter); antennis (articulo basali excepto) pube nigra albidaque variegatis, subtus pilis subtilibus sparsis fimbriatis, articulo 3° quam 1us 2us que conjuncti parum longiori; prothorace quam longior ut $4\frac{3}{4}$ ad 4 latiori, sat cylindrico, vix manifeste punctulato, sat fortiter transversim (et pone medium confuse) rugato, lateribus fere inermibus; elytris longitudinaliter late leviter bisulcatis, in partibus anticis tribus costis brevibus obliquis vel transversis granulisque nitidis inordinatim instructis, sparsim minus fortiter punctulatis, ad apicem subtruncatis.

Maris antennis quam corpus vix brevioribus; segmenti 2^{i} ven-

tralis parte antica dimidia ad latera pilis elongatis pallidis dense vestita.

Feminæ antennis manifeste brevioribus, segmento 2° ventrali normali. Long., 8—10¼ l.; lat., 2⅔—4¼ l.

In a perfectly fresh specimen the upper surface is covered with a very fine grey pubescence scarcely noticeable by the naked eye. On this, markings are formed by longer and denser pubescence of intermingled whitish and ochreous colour, presenting on the head variable spots and lines, on the pronotum numerous small specks, on the elytra a kind of network of spots and blotches which arrange themselves most conspicuously behind the scutellum, on the lateral margin behind the shoulder, in a flexuous fascia behind the middle, and in an aggregate filling up the apex. The markings however are little to be relied upon as they are variable and very easily rubbed off and an even slightly rubbed example does not look as if its markings had ever been as described above. The species, however, is easily recognisable by structural characters,—especially its head almost punctureless but having a few very deep punctures close to the inner margin of the upper lobe of the eye,—its elytra each with two very wide shallow longitudinal impressions not nearly reaching either the base or apex (best seen in abraded specimens),—its elytra studded on the whole front three quarters of their area with strong and somewhat coarse shiny granules and short ridges (not unlike those on the front part of the elytra of *Penthea sannio*, Newm.) which are not at all concealed by the pubescence,—and the male characters on the second ventral segment. These consist of a space on each side extending along the front margin of the segment from the lateral margin nearly to the middle and limited hindward by a curved line joining the extremities of the front of the space and reaching hindward to about the middle of the segment,—the part of the segment not occupied by this space being pubescent and marked uniformly with the other segments, but the space itself being densely clothed with long soft pale hairs.

This insect is very likely to be the *Rhytiphora* referred to by Mr. Gahan (Tr. E.S., Lond., 1893) as possibly identical with *caprina*, Newm., or *mista*, Newm., neither of which is intelligibly described,—or (judged by Mr. Gahan's remarks) recognisable by comparison with the types. The former seems to be much smaller than the smallest specimen I have seen of the present insect and is described as having "dentiform tubercles near the base of the elytra" (very different from the sculpture of the present species), and the latter I take to be an allied but very distinct species widely distributed in Southern Australia of which I have seen many examples.

Tasmania; given to me by Mr. Simson. It is found on *Casuarina*.

CORRHENES.

C. pauxilla, sp. nov. Picea plus minusve rufescens; pilis subtilibus erectis sat crebre instructa et pube grisea vestita, hac pube fusca et albida intermixta; antennis minus robustis, quam corpus vix brevioribus, articulis singulis pube pallide fusca albidaque confuse variegatis, articulo 3° quam 1us sat longiori; oculis sat fortiter granulatis; prothorace parum transverso, supra sat æquali (longitudinaliter obsolete carinato), lateribus antice dente perspicuo armatis; elytris sat crebre sat fortiter punctulatis, ad apicem rotundatis. Long., $4\frac{2}{5}$ l.; lat., $1\frac{3}{5}$ l.

This species differs in some structural characters from *C. paulla*, Germ. (the type of *Corrhenes*), but I cannot ascertain that any other genus has been founded in which it could be placed and its divergence from *Corrhenes* is scarcely sufficient to justify making it the type of a new genus. Its antennæ are evidently less robust than those of *C. paulla*, its eyes are more strongly granulate, and the lateral tubercles of its prothorax (though similarly situated) are notably better defined.

Unfortunately the descriptions of nearly all the Australian species attributed to *Corrhenes* are of the slightest and most unsatisfactory kind and there is comparatively little in them except loose diagnoses of colour and markings. As, however, these seem to be but little subject to variety (judged by *C. paulla*, Germ.,—the only *Corrhenes* of which I have seen numerous examples) it is perhaps fairly safe to assume that a *Corrhenes* differing markedly in these respects from all previous descriptions is a good new species.

The present insect is covered on the upper surface with close and somewhat coarse pale brown pubescence variegated with dark brown and whitish. The dark brown pubescence forms a line running backward from the inner margin of each eye and continued on the pronotum to about its middle, the two lines being curved in such fashion as almost to meet on the front margin of the pronotum; the dark pubescence also forms a large ill-defined common blotch behind the scutellum. The whitish pubescence is chiefly along the base of the elytra, along the middle part of the suture, and (somewhat behind the middle) on the disc of the elytra where it forms a somewhat wide fascia (with its front and hind margins strongly zigzagged) running obliquely forward from the lateral margin but not reaching the suture. This fascia is much more sharply defined in some examples than in others. The under surface is uniformly covered with pubescence of a whitish brown colour. The antennæ femora tibiæ and tarsi are variegated with dark and light brown pubescence.

Compared with *C. paulla*, Germ., the form is a trifle shorter and more robust, the antennæ are less robust and the separate joints are mottled (or spotted) with light and dark brown (the apical part of each chiefly *dark* brown), the eyes are a trifle larger and distinctly more strongly granulate, the sides of the prothorax are tubercled near the front almost as in a *Micracantha*, and the general arrangement of colours differs considerably. The prosternum and mesosternum subtruncate on their opposite faces and the upper surface clothed with long erect soft hairs are generic characters.

N.W. Australia (sent by Mr. Masters).

Notes on Glacial Beds of Cambrian Age in Far North of South Australia.

By Chas. Chewings, Ph.D., F.G.S.

[Communicated by Prof. Tate.]

[Read May 7, 1901.]

The Note on the Glacial Beds of Cambrian Age in South Australia, read by Mr. Walter Howchin, F.G.S., before the Royal Society of South Australia, has greatly interested me for the following, amongst other, reasons:—While in the service of the Umberatana Trust, in July, 1899, I visited the Worturpa gold discovery, and saw in that neighbourhood a very extensive rock formation that resembles so closely the description Mr. Howchin gives—as published in the *Register* of April 3rd—that I do not hesitate to say that a rock formation identical in character has a very extensive development in the Flinders Ranges, much farther North than Mr. Howchin has had an opportunity of seeing. I may here state that, through having other duties to attend to, it was not possible for me to make more than a casual and very hurried examination of the beds I refer to, and I had to leave the district, much to my regret, without making the close investigation I had promised myself; and no opportunity has presented itself to me to visit the locality since. I hesitated, in the absence of striæ markings, &c., which I had not seen, to call the beds other than Conglomerate, because (1) Cambrian glacial "till" is not seen every day, and (2) the discovery of such had not been made, to my knowledge, in the Southern Hemisphere at that time; (3) the boulders in places were rounded off, and (4) to classify the beds as glacial till of Cambrian age, without being sure, was premature. I may say that from the fossils found near Beltana, and lithological and stratigraphical characteristics generally, and also failing to find any trace of fossils, I supposed the beds to be of Cambrian age. It is quite certain they are not younger than the old Palæozoics. I congratulate Mr. Howchin on being the first to discover indisputable evidence of ice action.

Worturpa lies 60 to 70 miles easterly from Leigh's Creek Railway Station. Hereabouts is one of the roughest parts of the Flinders Ranges. Benbonyathe, the highest point, is not far off. In most directions the country is rough and rugged in the

extreme. Bold mountain tops rise here and there. Serrated ridges, with precipitous and over-hanging escarpments, form impassable barriers for miles. The rough boulder-bestrewn creek channels, full of teatree thickets, are about the only possible ways of entrance into this wilderness of hills. Of such is the district where perhaps the grandest developments of this interesting rock formation may be seen.

Fortunately, for the investigation of these beds, fairly accessible places exist. One is in the Balcanoona Creek, two or three miles S.E. of the Stone Hut. The bridle-track from Balcanoona Station to Stone Hut runs right across the outcrop, as does also the creek, in which is a permanent running stream of fresh water. The strata stand vertically, and near to that, at this place, which is one of the best exposures I saw. The outcropping edges would be—speaking from memory—one to two miles across. The strike of the beds is N.E. to N.N.E., and the till, or conglomerate, bands of rock form the core of this range, which we may, for distinctive purposes, call the Mt. McTaggart Range, as a mountain so designated is a conspicuous landmark in it a few miles farther north. I should say that the beds rise eight, ten, and fifteen hundred feet above the plain. On the S.E. side of the beds, the erratics—which in places would weigh many tons—decrease in numbers, and graduate off until the rock is sandstone, quartzite, and farther afield, limestone and mudstone. On the N.W. side the beds are backed up by slate and massive magnesian-limestone bands. In this direction a great development of crystalline limestone occurs of several square miles in extent. This limestone appears as a local and distinctive feature. Away to the south, banded and blue limestone of considerable extent is seen in the south branch of the John Creek, but it bears slight resemblance to the Worturpa white crystalline limestone. I may here state that cupriferous veins occur in all the rocks mentioned. Ironstone blows, with crystals of magnetite, are also seen; and extensive areas of rock are stained black with manganese.

This latter is particularly the case in another place, where the beds have a very extensive development, viz., going north and following the Italowie Creek from the Italowie Gap towards Worturpa. The bridle-track leads over miles of this rock, here composed for the most part of red sandstone and quartzite, filled with erratics. Many of the erratics have been sheared through by earth movements as clean as has the matrix in which they are embedded. The "till" is first seen close to the gorge entrance, and continues for three or four miles. The high hills on either side, and the gorge, are wholly of the same rock formation. From Balcanoona Creek to this exposure is seven or eight miles, and

the same geological conditions continue from the one exposure to the other along the Mount McTaggart Range, and for several miles farther north to the mount of that name. West of the mount, along the bridle-track to the Reward Gold Claim, extensive exposures are seen. It is also probable that the mount itself, and the range that extends farther north, had a similar origin. The same formation quite likely extends to the Arkaroola Creek, and even beyond that. I saw a conglomerate-quartzite west of the Mount Fitton South Mine. It is not within my personal knowledge that beds identical in character do extend away to the south from those exposures I have mentioned, but from what I saw and heard I suspect that the same will be found to exist at intervals right through to Mr. Howchin's "farthest North" point.

The Flinders Ranges have been so often described that a repetition is not necessary here, but I may say that the "till" band or bands herein noticed form a part of the primary rock formations in that range, and were subjected at a distant geological date—earlier than the Cretaceous period—to tremendous earth movements. In the instances under notice the effects of disturbance are everywhere apparent, and it is more than probable—seeing on how vast a scale the rocks have been thrown about, and also how dependent such formations are on the contour of the country during their formation—that the recognisable outcrops will by no means follow a straight course, nor be continuous throughout. The Worturpa exposures, however, to my mind, practically extend the known area over which glacial action obtained in Cambrian times to more than double the longitudinal distance shown by Mr. Howchin, and to have occupied—in general terms—the entire length of the Mount Lofty and Flinders Ranges. The elevated area of land on which the incap rested, and from which the material was derived to build up the till at Worturpa—judging from the dip of the strata over a considerable area—lay to the North, West, and South-West; but this must only be regarded as a suggestion.

That such an interesting and prominent, and I may say historically important, feature should have remained so long undiscovered, shows how little is really known, and how necessary a detailed examination and geological mapping of the State has become.

Descriptions of New Species of Corals from the Australian Tertiaries.

By J. Dennant, F.G.S.

[Read May 7, 1901.]

Part III.

Plate II.

In the present paper I remark further upon the genus *Trematotrochus*, and describe three additional species belonging to it.

In Part I. of this series of articles I placed the genus *Trematotrochus* amongst the Eupsammidæ, in the section Madreporaria Perforata, because both in Tenison Woods' type species, *T. fenestratus*, and in *T. Clarkii*, the new one described, there are intercostal pores in the wall. A similar perforation of the wall is also conspicuous in *T. complanatus* and *T. lateroplenus*, species described in Part II. Since doubt has been expressed by some European writers as to the actual penetration of the mural pores in Woods' species, I take the present opportunity of supplying a drawing of the internal wall, as seen under the microscope by transmitted light. A specimen was hardened with Canada balsam, mounted on a slide, and then divided longitudinally, the inner as well as the outer surface of the mounted half being left intact. That light is now freely admitted through the pores is evident from the drawing (Pl. II., fig. 1). I have next to call attention to two interesting corals, in which the wall, though fenestrated in the manner characteristic of *Trematotrochus*, is not actually perforate. The intercostal spaces are, as usual, regularly crossed by thin transverse bars, with pore-like cavities between; but the latter do not penetrate the theca. In external appearance, as well as in the arrangement of their septa, costæ, &c., these species are analogous to the *Trematotrochi* already described, and I, therefore, include them in the same genus. My revised diagnosis of that genus will, I consider, admit them, the wall being described as incomplete in the intercostal spaces, and regularly fenestrated. By their inclusion, however, it becomes necessary to review the position of the genus itself in the madreporarian series.

Of the seven species now known, *T. Clarkii*, the only Miocene one in the genus, has strong Eupsammian affinities. Two of those figured below, viz., *T. Kitsoni* and *T. declivis*, might

perhaps be described as Turbinolids with a fenestrated wall, while the remainder are intermediate in character. So far as development is concerned, there can be but little doubt that *T. Clarkii*, the Miocene species, has descended from *T. fenestratus*, a widely spread Eocene coral. Again, *T. Kitsoni* is specially characteristic of certain Eocene beds antecedent in age to those from which the closely allied forms *T. complanatus* and *T. lateroplenus* have been recorded. The calice of *T. Kitsoni* is very similar to that of *T. lateroplenus*—and, indeed, almost the only important difference between the two corals is that in the latter the mural pores completely penetrate the wall, while in the former they do not. On the strength of such striking analogies between these species, I venture to suggest that the younger of the two has been derived from the older. I may add that *T. fenestratus* ranges throughout the Eocene, while *T. declivis* is restricted to a single outcrop, which I correlate with the older beds.

The above suggestion of mine touches, of course, upon a debateable question, viz., the development of the perforate type of corals from the non-perforate. Instead of attempting to discuss this subject myself, I prefer to direct attention to the able remarks made upon it by Dr. J. W. Gregory in the Introductory Note to his Monograph of the Jurassic Corals of Cutch.* It will be seen by the following short extract from that work that the genus I am now dealing with is regarded as an important factor in the question at issue :—

"It is true that there are some remarkable resemblances between the three families of Perforata and the three groups of non-perforate Madreporaria. The simple Eupsammidæ are in many ways like the Turbinolidæ. . . The parallelism between the groups of cainozoic Perforata and mesozoic non-perforate corals may be either a case of homoplastic modifications in two series of corals, or it may indicate that the three families of Perforata have descended from different members of the non-Perforata, the porous character of the later corals being independently acquired, like the bipedal habit of birds, of some reptiles and some mammals.

"The latter explanation would necessitate the dismemberment of the group Perforata, and it appears to be supported by the asserted occurrence of mural pores in some Turbinolidæ. This assertion rests in the main on *Trematotrochus*, a genus founded by J. E. T.-Woods. . . So far as I am aware, no specimen has been seen in Europe, and the only figure available is the original published by Woods. . . The coral may be one of the Eupsammidæ."

* Pal. Ind., ser. IX., vol. II., part II. (1900).

Reference has also been made to this genus by Dr. Maria M Ogilvie, who states that pores are present in its theca in the same position as the intercostal dimples of *Turbinolia*, and in the same position as the pores in the thecæ of *Turbinaria*, *Porites*, and *Madrepora*.* But by Miss Ogilvie's scheme for the classification of corals, which is based on the microscopic study of the skeletal features, the two families of Turbinolidæ and Eupsammidæ are not only placed far apart, but they are regarded as sprung from separate main trunks.† Her conclusions appear to be contradicted by the Australian genus under review, which, with a Eupsammian-like wall, has yet certain affinities with Turbinolids.

Further consideration of the classification of *Trematotrochus* will be best postponed till the present series of papers is completed.

The species now to be described are the following:—

Trematotrochus Kitsoni, *spec. nov.* Pl. ii., figs. 2*a*, *b*, *c*.

Corallum small, free, and compressed. It is a flattened cone in shape, with a rounded, sub-acute apex. Calice shallow and elliptical, with its diameters in the ratio of 100 to 75.

Septa granular, and in six systems with four cycles, of which the fourth is developed only in the end systems. In this respect the coral resembles *T. lateroplenus*. The primaries are stout, and the remaining cycles diminish in thickness according to order. As a rule, the septa are free; but, as in the type calice, some may be irregularly united towards the columella by means of intermediate solid tissue. Stereoplasm is also developed to some extent in the interseptal loculi.

Columella elongate, nodular at its upper surface, and almost spongy inferiorly. The primary and secondary septa are fused with it either directly or by means of thin processes. There are no pali, but the thickened ends of some septa, chiefly the secondary, may be regarded as paliform lobes.

The costæ, or septo-costæ, as they may appropriately be called, are minutely granular, sub-equal in thickness, and prominent on the wall of the corallum. Those of the first and second orders unite at the base; just above this the secondaries are joined by the tertiaries, and the latter again by the quaternaries a little higher on the wall. The intercostal spaces are about equal in width to the costæ, and are crossed by a regular series of transverse bars, which separate longitudinal cavities in the wall. There is, however, no real penetration of this, as in the previously

* Microscopic and Systematic Study of Madreporarian Types of Corals. Phil. Trans., ser. B., vol. CLXXXVII. (1897), pp. 249 and 333.

† Op. cit., p. 296.

described species, the pore-like cavities only extending about half-way through the theca. In looking down upon the calice, the marginal portions of the uppermost row of intercostal bars can be seen as an outer wall just below the summit of the internal one. The bars themselves are solid, and form an integral part of the solid theca of the corallum. The structure of the wall is clearly indicated in a specimen from the Cape Otway section, which was fractured during fossilization (Pl. II., fig. 2*c*). The coral is not divided down the centre, but at the angle of two opposite primary septa; and the slight projection on each side of the fractured surface represents the thecal connection between primary and adjoining quaternary cycles of costæ. Internally this is solid, but externally it consists merely of a series of thin transverse bars.

Height of corallum, 6 mm.; length of calice, 5·5 mm., breadth of calice, 4·2 mm. The specimens vary in size, and slightly also in proportionate measurements. The above dimensions refer to a large one selected as type for the calice. The corallum figured is 5·5 mm. high. An example from Adelaide, which is fractured similarly to the figured one from Cape Otway, is 5 mm. high.

Localities.—Abundant in the earlier Eocene of Adelaide bore, Cape Otway, and Wilkinson's Aire Coastal Section No. 4 (types). Rare in the later Eocene, west of Gellibrand River.

The species is named after Mr. A. E. Kitson, in recognition of his discovery of additional Tertiary outcrops in the vicinity of the Aire River.

Trematotrochus declivis, *spec. nov.* Pl. ii., fig. 3*a*, *b*.

The corallum is in outline an inverted short cone, with a steeply sloping surface. It is an elegant species, and by far the largest of the *Trematrochi*. The base is sub-acute, and the calice is wide, open, and slightly elliptical. The ratio of the diameters of the ellipse in the type is as 100 to 89, but in another and somewhat larger example this becomes 100 to 95.

Septa in six systems, with four cycles, all of which are regularly developed. The first two orders are stout and exsert, especially the primaries; the tertiaries are much smaller, while the quaternaries are thin and comparatively inconspicuous laminæ. Some septa are occasionally notched near their central terminations, but this is not a regular feature of the calice.

The columella consists superficially of a thin, tortuous, rod-like structure, with occasional projections on its surface. Offshoots from it to some of the septa simulate pali, but from their irregular development I judge them to be merely portions of a fascicular columella. All the septa of the first and second orders are fused to the columella, either by these paliform offshoots or by solid processes just below its surface.

The costæ, which are continuations of the septa, are stout and prominent on the wall. The primaries and secondaries are equal, and a little thicker than the tertiaries and quaternaries, which are also equal. All gradually diminish in size towards the base of the corallum. The first three cycles unite at the base, and the tertiaries are joined by the quaternaries a little higher up. Each intercostal space is crossed by a regular series of transverse bars, with pore-like cavities between. In one specimen I counted 27 bars, with their corresponding cavities, between two adjacent costæ. As in the case of *T. Kitsoni*, these cavities do not penetrate the wall, which is continuous within the calycle. Similarly, also, the theca of this coral is stout, except where reduced in thickness by the series of cavities in the intercostal spaces.

Height of corallum, 7·5 mm.; length of calice, 8·6 mm.; breadth of calice, 7·8 mm. These are the dimensions of the type. A larger specimen obtained lately is 10 mm. high, and has an almost circular calice, its diameters being respectively 10 mm. and 9·5 mm.

Localities.—Rare in an outcrop of the older Eocene at the mouth of Brown's Creek (adjoining Joanna River), on the south coast of Victoria. Four specimens, of which one is less than half the size of the type.

This species, as well as the section in which it occurs, was discovered by Mr. Kitson in 1899.

Trematotrochus Mulderi, *spec. nov.* Pl. ii., figs. 4*a*, *b*.

Corallum small, free, very much compressed, and long in proportion to its breadth. Both the anterior and lateral surfaces slope gently to a flatly rounded base.

Calice subplane and elliptical, with its diameters in the ratio of 100 to 59.

Septa straight, free, and in six systems, with three complete cycles, of which the third is very thin, and projects but a short distance into the calice. The two principal orders are stout, especially the primaries, and unite with the columella by lobed and thickened ends.

The columella is large, prominent, and elongate, with a nodular surface. A transverse section of a corallum cut at about one-third from the base shows a solid interior without a trace of the septa or columella. In another example cut midway between the base and calice the interseptal loculi are still open. A third corallum cut longitudinally has the calycle solid almost to its summit, but the former outlines of the septa are faintly marked nearly to the base. Possibly the infilling of the visceral chambers in this species is due to a secondary deposition of carbonate of lime. As a fact, not only the corals, but other organisms from

the same fossil bed—e.g., the mollusca—are much invested with concretionary calcareous matter. This peculiarity was commented upon by Messrs. Hall and Pritchard when describing the geological section.*

The costæ, which are minutely granular, are continuations of the septa, and vary in size according to their position on the corallum, and not according to their cyclical order. On the central portions of the anterior surfaces they are subequal and comparatively slender, and then gradually increase in thickness to the lateral primaries, which for such a small coral are very stout. At the actual margin of the calice the difference in the thickness of the costæ is inconsiderable, but the central ones rapidly diminish in size as they recede from the summit, while those at the ends become, if anything, a little stouter. In the four lateral systems all the costæ are free to the base, but in each central system, while the primaries remain free, the tertiaries fuse with the enclosed secondary low down on the wall. The intercostal spaces are narrower than the costæ, and are regularly fenestrated by a series of numerous transverse bars and intervening cavities, which, in this species, I regard as real pores penetrating the theca. I have decided this latter point on a single example, which was accidentally fractured for a short distance down an intercostal space. Four or five of the cross bars are left intact, and show a clear passage between each from the outside of the corallum to the interior. In other more perfect individuals this delicate characteristic is practically obscured by the calcareous coating previously referred to.

Average height of coralla, 6·2 mm.; a long one measures 8·2 mm. The calices are almost uniform in size. The diameters of the type are 3·2 mm. and 1·9 mm.

Locality. — Lower beds (Eocene) at Maude. Numerous examples.

I have great pleasure in naming this species after Mr. J. F. Mulder, my companion in many geological excursions.

EXPLANATION OF PLATE.

Plate II.

Fig.

1. Section of wall of *Trematotrochus fenestratus*, drawn under the microscope with transmitted light. Highly magnified.
2. *Trematotrochus Kitsoni*. *a*, corallum, 5 diam.; *b*, calice, 8 diam; *c*, section of corallum showing structure of wall, 5 diam. (These three drawings represent different specimens.)
3. *Trematotrochus declivis*. *a*, corallum, 3 diam.; *b*, calice, 6 diam.
4. *Trematotrochus Mulderi*. *a*. corallum, 5 diam.; *b*, calice of another specimen, 10 diam.

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* The Older Tertiaries of Maude. Proc. Roy. Soc., Vic., 1894, p. 187.

NOTES ON THE EXTINCT VOLCANOES OF MOUNT GAMBIER AND MOUNT SCHANK, SOUTH AUSTRALIA.

BY WALTER HOWCHIN, F.G.S.

[Read June 4, 1901.]

It is somewhat remarkable that the interesting volcanic district, situated in the south-east of this State, has not been more thoroughly examined and described. No monograph, such as would do justice to the subject, has been attempted, and the strictly scientific literature, dealing with the extinct volcanic phenomena of the district, is very limited. The Rev. Julian E. Woods, in his work, "Geological Observations in South Australia" (1862), devotes three chapters to the subject. Mr. Wood's descriptions are vivid and painstaking, and have long been regarded as the main work on the subject. In 1884 Mr. H. Y. L. Brown, the Government Geologist of South Australia, published a brief report "On the Lakes in the Mount Gambier District," accompanied by geological sketch plans showing sections through the principal volcanic mounds, lakes, and deposits. If to these references we add a paragraph in Professor Ralph Tate's presidential address before the Philosophical Society of Adelaide in 1879, we have noted the principal sources of information that have been published on the subject. There can be little doubt if the country was exhaustively examined much new light would be thrown on the origin, character, duration, and other aspects of the volcanic activity.

The present notes are of slight pretensions. They do not aim at exhaustive treatment, but are the fruits of a few observations made during a recent brief visit to Mount Gambier and neighborhood.

MOUNT GAMBIER.

Mr. Woods advocates the view that the lineal chain of lakes at Mount Gambier represent a series of crater vents. He also believed that in the case of the Blue Lake and the Valley Lake subsidence preceded, and probably gave rise to volcanic vents in these positions, and that, in all, there were five craters in the Mount Gambier group.* Sections of the material forming the volcanic mound can be seen in many places,

* Op. cit., p. 250, et seq.

but they do not tend to sustain Mr. Woods' theory of multiple vents. The quaquaversal dip points to one centre of ejectment, whilst the depressed areas of the Blue Lake, the Leg of Mutton Lake, and the Valley Lake are undoubtedly sunken areas, the subsidence taking place late in the period of activity, or even after the volcano ceased to eject material.

This was the view taken by Mr. Brown, the Government Geologist, in the report already referred to, where he says: "From the contour of the Blue and Valley Lakes, and Lakes Edward and Leake, together with the appearances in their neighborhood, I think that they are not craters, but merely depressions caused by subsidence of the crust, consequent on the removal from below of such vast quantities of material as it is evident has been erupted."

A section, visible on the road which passes between the Blue Lake and the Leg of Mutton Lake, shows ejected material dipping away from the Blue Lake toward the Leg of Mutton Lake, looking as if it had formed part of a cone built up around the brink of the former. This I take to be a *false* dip, caused by the subsidence of the ground where the present Leg of Mutton Lake occurs, and thereby giving a tilt inwards of the beds around the subsided area.

The outline of the crater, proper, can be easily traced at the western extremity of the lakes, distinguished by the nearly circular outline of the walls and the quaquaversal dip of the cone. The southern segment is apparently almost intact, constituting the highest point of the Mount. The western and northern walls have suffered considerable erosion, whilst the eastern wall appears to have disappeared with the subsidence which gave rise to the Valley Lake. A small sheet of shallow water occupies the bottom of the crater, known as the "Crater Lake" or "Browne's Lake," and is alternately an independent sheet of water, or merges into the Valley Lake, as the water of the sunken areas mysteriously rises and falls.

The interior of the crater is marked by the presence of much stalactitic lava, which, when broken, has a pitchstone lustre. Some of it is evidently in situ, notably on the western side, where there is a most instructive face, about 30 ft. in height, that must have formed the true walls of the funnel. The consolidated igneous material can be seen in great folds, dripping sheets, and bulging bosses, separated by open spaces. The same kind of lava can be seen in situ near the bottom of the crater, as it passes under the lake which occupies the depression. Much stalactitic lava also occurs, mixed with the ash, at all elevations on the inner face of the vent. Some of these isolated fragments have been probably broken from the face of the funnel at lower levels, and hurled upward by force of the explosions.

There has been a considerable outflow of lava from the crater at an early stage of the eruption. This lava sheet, which is often very compact, and frequently contains crystals of olivine, can be seen in section both in the cliffs of the Valley Lake and the Blue Lake. Only a small amount of ash was ejected before this outflow, as is evident by the thin deposit that underlies it, varying from almost nothing up to 2 or 3 ft. in thickness.

The normal level of the ground before the eruption is indicated by the upper surface of the Eocene limestone, or a thin layer of sandy soil (presenting now a reddish color), which in places can be seen to rest upon this limestone, separating it from the ash or lava beds. The Eocene beds are not visible within the limits of the crater, but they take the form of mural cliffs in the lowest exposed positions surrounding the sunken areas of the Valley and Blue Lakes.

The main stream of lava appears to have flowed in the direction of the Blue Lake, as the thickest section (about 50 ft.) occurs in the vertical cliffs of this lake on the side nearest to the crater. When this fine section of lava is viewed from a boat on the water it is peculiarly striking and awe inspiring. The flow in this direction is somewhat irregular, and seems to have thinned out considerably on the eastern side of the lake. In places some instructive sections can be seen where the lava has ploughed up the ash and soil over which it has passed, throwing the layers into contortion and consolidating the material under igneous action. Good examples of these effects are visible by the side of the path which leads down from the pumping station to the boathouse.

EJECTAMENTA.—The structure of the volcanic cone is remarkably uniform. The stratification where visible is regular and unbroken, giving no evidence of rupture by igneous intrusions. On the outer slopes of the Mount the volcanic tufa has been reduced under atmospheric conditions to a fine dust, but within the crater the beds are somewhat indurated, probably from heat, which has enabled them the better to resist the disintegrating forces.

Evidences are abundant that the volcanic fires broke through solid beds of rock in reaching the surface. Large blocks of the local limestones, red and grey dolomite, fossiliferous Eocene, black flints, Tertiary sandstone, and angular fragments of lava are abundant, as well as volcanic bombs composed of lava or olivine. The dolomitic limestones are altered fossiliferous beds of Eocene age, and are found in situ overlying the latter in many parts of the district. The ejected fragments of dolomite are indistinguishable in their structure, color, and composition from the stones that are quarried at a

distance from the Mount, showing that the dolomitization of these beds had taken place before the period of volcanic activity. Many of the blocks of limestone contain layers of black flints in situ, and in mass measure up to 6 and 9 ft. in diameter. The flints, which became separated from their matrix before ejected, are frequently bleached and flaked by the heat to which they have been exposed.

The presence of large blocks of lava in the tufa is proof that the periods of activity were intermittent, for such consolidated lava must have been formed during periods of rest, when the magma may have cooled sufficiently to form a solid plug to the vent, only to be broken and ejected in angular masses when the volcanic forces broke out afresh. Some very large masses of limestone occur almost at the highest point of the cone, showing that the forces of ejectment were intense even in its later stages.

The finer material, comprehended under the general term of ash, is highly interesting. It may be said to consist of papilli, ash, and fine earthy material, the latter consisting largely of grains of sand. The presence of alluvial matter extensively mixed with the ash points to the conclusion that the eruptions were a mixture of mud and scoriaceous material. That this should be the case seems probable from the geological features of the district, and the indications that the volcanic foci were at shallow depth. The sedimentary rocks that are represented among the ejected material are almost entirely limited to those of Eocene age, which form the superficial geological features of the neighborhood. One or two small fragments of a siliceous quartzite were observed in the tufa that may have come from an older series below the Tertiary beds, but the almost total absence of such older rocks from the ejectamenta is suggestive.

The Eocene limestone is the great water-bearing stratum of the district. The depression of the Blue Lake and others, including the Crater Lake, are below this subterranean water-line; hence they contain water, which in the case of the Blue Lake has an average depth of 250 ft. The whole of this south-eastern country, at the level indicated, is saturated to an enormous extent. There is every reason to think that these hydrographic conditions existed at the time of volcanic activity, and may have acted as an important factor in creating the igneous outbreak. It would also give character to the eruption, and make the vents, more or less, mud volcanoes. There are, indeed, some evidences that a lake existed in or near the Mount Gambier crater before the original eruption, or during a period of quiet. Laminated mud, in irregular blocks, can occasionally be seen in the ejected material. One remark-

able example in my possession, obtained when the present road down to the bottom of the crater was being cut, shows a finely laminated sedimentary deposit, thickly covered on the faces of the laminæ with vegetable impressions. The deposit is evidently a recent one, and has become hardened, rendered fissile, and the vegetable matter carbonised by the heat. In addition to the sand, which makes up so large a proportion of the "ash" beds, there occur in some parts of the inner face of the cone a fair number of small waterworn quartz pebbles, ranging up to the size of a marble, which it is difficult to account for except on the supposition that they once formed part of a lake beach, or small shingle of a running stream, that occupied the site of the extinct volcano.*

Mount Schank.

This volcanic cone, which rises abruptly from the plain and forms a striking feature in the landscape, is about eight miles south of Mount Gambier. The Rev. Tenison Woods described Mount Schank as possessing two vents, an older and much wasted cone, and a newer vent, which had formed on the northern rim of the older crater, the newer vent constituting the main Mount of to-day. Mr. Woods has, I think, entirely misunderstood the features of the mountain in this respect. All the appearances indicate that the ejected material, which has built up the Mount, has come from the same vent. What Mr. Woods regarded as an older crater is a depression caused by the subsidence of the walls of the crater on its southern side. This appears to be the case from the following consideration:

(*a*) The fracture of the walls in the so-called "older crater" is perfectly sharp in outline, and the face has not been obscured in any way by showers of ash, which, on Tenison Woods' theory, must have been scattered over the base of the mountain, and more or less obliterated the outline of the older crater had it existed.

(*b*) The rim of the "older crater," instead of being quaquaversal in its dip, as viewed from its centre, is seen to make a symmetrical curve passing upwards to the summit of what is regarded, in Tenison Woods' theory, as the "newer vent," proving that the latter has been the source of the ejected material.

(*c*) The segment of the crater, where the subsidence has taken place, has a greater steepness than other portions in the external slope of the cone, and is concave in outline.

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* It is possible that the sand and small shingle which are found among the ejected material may have had their origin from the breaking up of friable Tertiary sandstones within the limits of the vent.

(*d*) The rim of the crater on the side where the subsidence has taken place is broken in outline, and lower than the rest.

(*e*) The ash beds, which are distinctly stratified within the limits of the vent, are seen to be *faulted* as the result of the subsidence.

This fracture of the base of the mountain on one side has given a most instructive section of the beds for a thickness of some 60 or 70 ft. Very large blocks of fossiliferous Eocene limestone, as well as the grey and red dolomite, common in the tufaceous material of Mount Gambier, are seen protruding from the ash beds. One block of limestone measures fully 20 ft. in diameter. It might have been regarded as a natural outcrop had not the evidence been clear that it rests upon the ash, which has been disturbed by the force of its impact.

Ejected blocks of lava, whilst common at Mount Gambier, are rare in the cone of Mount Schank, and so far as I examined the ejected material there is less indication of mud and sand, the finer material of the cone being composed almost entirely of ash, papilli, and scoriæ.

The Lava Field.

One of the most interesting features of Mount Schank is the lava field, which occupies the comparatively level ground on its western side, and may be estimated as extending about one and a quarter miles laterally to the Mount and three-quarters of a mile wide. Tenison Woods, in his "Observations" (p. 274, et seq.), says: "It seems, for many reasons, very clear that this stream proceeded from the ancient crater, and not from the more modern one." The reasons given for this conclusion are purely of a theoretical character, and do not rest on inductive observations. In a later passage he says: "This line of lava was, then, a current from Mount Schank's ancient crater; but, in supposing it to be so, it is not easy to account for the broken undulatory character of the scoriæ." This extraordinary arrangement of the lava, which was a puzzle to Tenison Woods in applying his theory, supplies one of the most important lines of proof which accounts for its existence. The inapplicability of Woods' theory to the facts is seen in that the lava thins out as it approaches that side of the Mount from whence he supposed it to have originated, and we have already shown that what he considered an "older crater" is nothing more than a local subsidence of a similar kind as has occurred around the Mount Gambier crater.

A careful examination of the lava field reveals the interesting fact that it has not been the product of one great outflow of lava proceeding from a single vent, but rather a network of

fissures existed throughout the area, out of which the lava was obtruded in limited quantities. The field exhibits an ever-varying surface of rough ridges and bosses of lava, which rise from 12 to 20 ft. above the normal level. In a few instances a stream has flowed for a short distance, but, for the most part, the lava has formed as an excrescence over the fissure from which it exuded, and the feeble attempts at flow have been circumscribed by other lava ridges which existed in close proximity.

A very instructive example of the way in which these lava ridges and bosses have been formed can be seen in an isolated ridge, which evidently owes its existence to a fissure on the north-west side of the mountain, originating at the base of the cone, and extending for about a quarter of a mile in a direction at right angles to the Mount. The lava is in the form of a steep broken ridge, which reaches a maximum height of about 40 ft. There is no sign of a stream or lateral outflow, but the igneous material has penetrated the superincumbent ashbeds in the form of intrusive veins, and thrown the beds in places into a high angle of dip. In consequence of this displacement of the superficial beds of ash the latter supplied the lateral walls by which the igneous rock was confined, where it imperfectly broke through the surface. The fissure has apparently greatly varied in its size at different points of its length. This can be noted by the broken outline of the ridge, dying out almost to nothing at one spot, and at others in a high angle of outcrop, forming an igneous boss that looks like a great basaltic wall.

Where the road crosses this ridge, which it does in one of its gaps, some excavation has been carried out and revealed a most interesting section, showing the relationship of the lava to the older ash beds. Tongues of lava can be seen penetrating the ashbeds, distorting them, but do not reach the surface. Others, somewhat stronger, break through the superincumbent mass and reach the surface. The section now described forms the bank on the east side of the road. On the west side of the same cutting the ashbeds are practically undisturbed, but within a few yards they are raised at a high angle, and the lava of the ridge reaches its greatest altitude in the height already mentioned. The ridge is separated by a considerable distance from the main lava field; the intervening space is level, and occupied by ash or soil.

A question of considerable interest is involved in the relation which the lava deposits bear to the volcanic ash with respect to time. Did the lava eruptions precede the ejectment of ash which built up the cone around the central vent? Or did such eruptions occur concurrently with the showers of ash?

Or even after the volcano had lost the power to eject? It is a remarkable fact that whilst the lava field lies immediately under the shadow of the mountain it is almost entirely free from ash deposits. The absence of such deposits cannot be referred to erosive effects, as the area contains a great many deep depressions between the walls of lava, which, on such a theory, ought to have been the receptacles of the ash, but they do not contain it, supplying the inference that no great amount of ash could have been thrown out from the crater subsequent to the outbreak of the lava at its foot.

On the other hand, a section supplied in the walls of the little lake, which exists immediately at the base of the Mount on its western side, shows the ash deposits entirely superior in position to the lava flow. This small depression, for such it is, is at a lower level than the present bottom of the crater, which accounts for the fact that whilst the latter is dry, the small outside depression has water in it, having sunk below the water level of the district. Around the greater portion of this lake there are vertical walls of Eocene limestone, like those encircling the Valley Lake and the Blue Lake at Mount Gambier. A thin layer of the old surface soil can be noted as resting on the limestone rock, hardened and discolored by the proximity of the igneous sheet which immediately overlies it. The lava at this point is for the most part compact in texture, but on the western side of the depression it is more vesicular, and in stalactitic forms, probably indicating the line of fissure at which the igneous matter reached the surface. This is still further rendered probable in that no limestone is seen in situ at this particular spot, having presumably been disturbed and removed by the intrusive rock. As already stated, the ash beds in this section entirely overlie the lava flow, and if they exist in their natural position must demonstrate that this particular sheet of lava was fed from a fissure that probably existed *before* the tufaceous cone was built up. It is possible, however, that the ashbeds, now covering the lava sheet, may be the effect of a rearrangement of material. The site is at the base of the cone, which rises immediately above it at a high angle, and it is not improbable that the scour of the side may have brought down the loose material on to the lava floor, producing a secondary series of deposits. If this was the source of the ashbeds, such rearrangement of material must have taken place before the depression of the lake occurred.

The evidence supplied by the great north-west ridge, described above, is more definite. There we have the igneous rock penetrating and distorting the volcanic tufa, demonstrating the anterior age of the ash. The same thing is proved by this fissure originating some distance up the side of the volcanic cone, and on which the lava is dependent for support.

The order of events, determining the relationship between the tufaceous material and the lava eruptions, may be suggested as follows:

(*a*) A primordial lava flow, which originated near the present small lake, on the western base of the mountain, and flowed over the old land surface before any ash was ejected, and, therefore, before the volcanic cone of tufaceous material existed.

(*b*) The great north-west fissure, which had its origin after a considerable thickness of ash had accumulated, and the cone was approximately developed to its maximum height.

(*c*) The great western lava field had its chief period of activity subsequent to the formation of the tufaceous crater, and probably marks the closing stages of the volcanic energy. It is possible that this fracture of the crust, on the western side of the mountain, and the outflow of molten material may have supplied the vent which relieved the subterranean tension and permitted the extinction of its fires. That the volcanic energy was in a state of decadence is seen from the absence of any one great stream of lava. The lava had little force behind it, and did little more than scar the surfaces of the fissures by which it found an exit.

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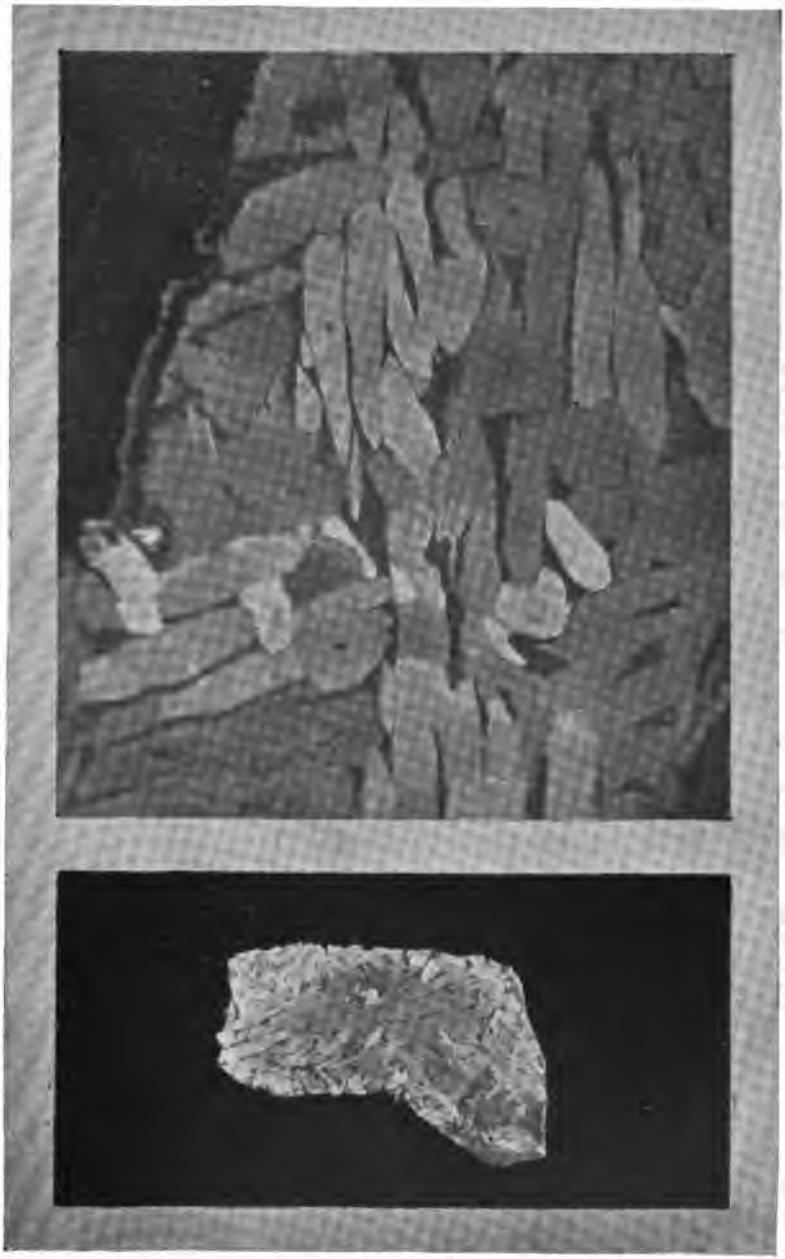

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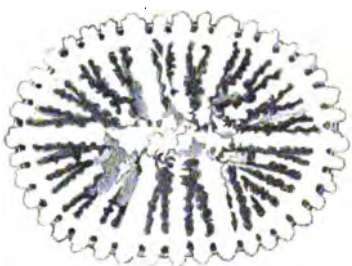

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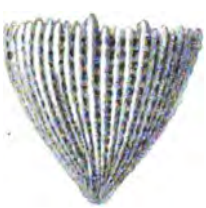

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TRANSACTIONS AND PROCEED

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REPORT

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Descriptions of New Genera and Species of Australian Lepidoptera.

By Oswald B. Lower, F.E.S., Lond., &c.

[Read October 1, 1901.]

BOMBYCINA.

Oiketicus erionota, n. sp.

Male, 30 mm. Head, thorax, abdomen, and legs whitish, densely clothed, face black, collar orange, anterior tibiæ, and tarsi blackish, middle and posterior pair ochreous. Antennæ black. Forewings elongate, moderate, costa faintly sinuate, termen gently bowed, oblique; light greyish fuscous, darker along costa and towards base; cilia grey-whitish. Hindwings with termen rounded; colour and cilia as in forewings. Underside of both wings with costa darker than above.

This species is remarkable for the densely haired abdomen and thorax, above and below.

Broken Hill, New South Wales; one specimen, at light, in May.

Zeuzera coscinopa, n. sp.

Male, 34 mm. Head, palpi, thorax, legs, and abdomen ashy-grey-whitish, thorax darker in middle. Antennæ dull ochreous, pectinations at greatest length 4. Forewings elongate, moderate, costa nearly straight, termen gently rounded, very oblique; dull whitish, evenly reticulated throughout, with fine black strigulæ; median third of wing becoming dark fuscous from base of costa to termen below apex, darkest on anterior half; cilia fuscous—whitish, strongly mixed with blackish. Hindwings with termen gently rounded; whitish, semi-hyaline, more or less finely reticulated with blackish strigulæ, more pronounced at apex and along inner margin; cilia as in forewings.

Nearest *neuroxantha*, Lower; but easily distinguished from that species by the absence of yellow veins and darker colouring.

Roeburne, Western Australia; one specimen. (Type in *Coll. Lyell*).

GEOMETRINA.

MONOCTENIADÆ.

EPIDESMIA OPHIOSEMA, n. sp.

Female, 30 mm. Head, palpi, antennæ, legs, and thorax grey-whitish, palpi 2½, blackish beneath and on sides, thorax with two longitudinal lateral black stripes. Abdomen greyish. Forewings elongate, triangular, costa nearly straight, faintly sinuate beyond middle, termen nearly straight, hardly oblique; grey-whitish, with well-defined black markings; costa narrowly dark fuscous from base to very near apex, attenuated anteriorly; a moderate, somewhat semi-ovate spot in middle of wing, nearer to costa than inner margin; a very thick streak from immediately before base, continued along inner margin to anal angle, thence continued parallel along termen to very near apex, with a very large deep sinuation below semi-ovate spot, and deeply sinuate posteriorly above inner margin, causing it to appear somewhat triangular above anal angle, and leaving a streak of ground color on inner margin throughout; an obscure fuscous line along termen; cilia greyish. Hindwings with termen nearly straight, apex somewhat prominent; light fuscous; a dark fuscous discal dot; cilia as in forewings.

Not very near any other, but very distinct by the thick black markings.

Perth, Western Australia; two specimens received from Mr. S. Angel, and taken in November.

SELIDOSEMIDÆ.

AMELORA HETEROPA, n. sp.

Male and female, 30 mm. Head, palpi, thorax, and antennæ reddish fuscous, in female grey-whitish, antennal pectinations 4, face with a moderate conical projection. Legs and abdomen greyish. Forewings elongate, triangular, costa slightly arched at base, thence straight; termen obliquely rounded; reddish fuscous, sprinkled with fine black scales, sometimes grey-whitish in female; a curved transverse series of 3 reddish spots at one-fourth; a large reddish discal spot; a waved transverse line of reddish spots, edged posteriorly in reddish specimens, with a fine line of greyish, from five-sixths costa to just before anal angle, moderately dentate at and above middle; cilia reddish fuscous, sometimes grey-whitish. Hindwings with termen faintly waved; greyish fuscous, lighter towards base, an obscure fuscous discal spot; a curved sub-median series of fuscous dots, more pronounced on underside; cilia grey-whitish.

Allied to the following species, but differs by the absence of the median band; the grey-whitish female is an abnormal looking variety, but is unquestionably referable to this species.

Broken Hill, New South Wales; three specimens (at light), during April and May.

AMELORA PLATYDESMA, n. sp.

Male and Female, 28–30 mm. Head, thorax, palpi, and abdomen silvery-grey, in female fuscous tinged, antennal pectinations 4, face with moderate horny projection, abdomen ochreous tinged. Legs greyish. Forewings shaped as in "*heteropa;*" silvery grey, irrorated with a few scattered fuscous scales; a broad dull reddish transverse median fascia, constricted on lower half, and edged obscurely with blackish, anterior edge strongly sinuate inwards, from costa at one-fourth to inner margin at one-fourth; posterior edge irregularly dentate throughout, projections more pronounced on upper half, from costa at five-sixths to immediately before anal angle; a large blackish discal spot; some blackish scales along termen, hardly forming definite markings; cilia silvery-whitish. Hindwings with termen faintly waved; grey-whitish, darker in female, but becoming lighter towards base in both sexes; an obscure transverse submedian series of moderate fuscous dots, more pronounced on underside, obscure in female; a faint fuscous discal dot; cilia as in forewings.

This may prove to be a variety of the above, as the markings approach very closely in both species. Should it be the case the present species is well worth a name, as it is such a distinct looking insect.

Broken Hill, New South Wales; two specimens taken at light in April. I have seen a specimen from Birchip, Victoria, taken in May.

CHLENIAS HETEROMORPHA, n. sp.

Male and female, 27-32 mm. Head, palpi, and thorax cinereous-grey, face with a median horny projecting plate, entire, apex acute. Antennæ ochreous, pectinations 4. Abdomen ochreous. Legs cinereous-whitish, posterior pair blackish. Forewings very elongate, triangular, somewhat narrower in female, termen obliquely rounded; fuscous, mixed with dark fuscous and whitish, so as to appear ashy-grey-whitish, lighter in female and mixed with ochreous and whitish; base ochreous in both sexes; veins irregularly outlined with blackish; a short oblique blackish streak from costa near base; a second, indicating first line, just beyond and parallel; costal space between whitish; second line similar to first, from one-third of costa;

subterminal dentate, blackish, scarcely perceptible, from costa at five-sixths to just before anal angle; a suffused fuscous spot above anal angle; veins towards termen shortly outlined with black, less pronounced in female; a fine black line along termen; cilia cinereous-grey. Hindwings with termen rounded; faintly sinuate below apex; whitish grey, somewhat darker along termen; a fuscous line along termen; cilia whitish.

Closely allied to *arietaria*, Gn., but differs by the much narrower forewings, which are not half as wide as forewings, the different shaped horny projection of head, which in *arietaria* is emarginate, and especially by the much shorter antennal pectinations.

Broken Hill, New South Wales; several specimens, mostly at light, in April. I have seen a specimen from Birchip, Victoria.

GEOMETRIDÆ.

EUCHLORIS TETRASPILA, n. sp.

Male, 24 mm. Head and thorax green, face green, fillet white. Antennæ and palpi ochreous-white. Abdomen greenish, whitish on sides and beneath. Legs ochreous, anterior pair light crimson. Forewings elongate—triangular; costa moderately arched, termen nearly straight, oblique; bright green; costal edge light crimson throughout, becoming darker and broader towards base, especially beneath; first line absent; a dark ferruginous discal spot; second line formed by an oblique transverse series of small white dots, from beneath costa at three-fourths to inner margin before two-thirds; cilia green, terminal half pale fleshy pink. Hindwings with termen angulated on vein 4; 3 and 4 short stalked; color, discal dot and second line as in forewings; cilia as in forewings.

Nearest *cadmaria*, Gn., but differs especially by the colour of palpi, antennæ and cilia, which in that species are crimson.

Kelso, Tasmania; one specimen in March. (Type in *Coll. Lyell.*)

EMMILTIS COSMADELPHA, n. sp.

Male and female, 14-18 mm. Head, palpi, antennæ, and thorax whitish, face ochreous. Abdomen ochreous. Legs whitish, anterior pair fuscous. Forewings elongate-triangular, termen gently bowed; whitish, faintly ochreous-tinged; a fuscous basal patch, outer edge faintly curved, bounded by a fine fuscous line, from one-fourth costa to one-fourth inner margin; a fine waved transverse line from costa before two-thirds to middle of inner margin, followed by a broad parallel light fuscous fascia, posterior edge

irregularly waved, and nearly reaching termen, and only separated from it by a moderate streak of ground color; cilia light fuscous. Hindwings pale yellow; cilia grey.

Allied to *trissodesma*, Lower, but immediately separable by the different colored hindwings, especially the female, which in that species are fuscous.

Broken Hill, New South Wales; two specimens in September (at light).

Pyralidina.

Scoparia anisophragma, n. sp.

Male, 16 mm.; female, 20 mm. Head, palpi, and thorax cinereous-grey, patagia white, palpi beneath blackish. Antennæ and legs blackish, irrorated with whitish, posterior legs greyish, tibia suffusedly banded with blackish. Abdomen greyish-fuscous, anterior segment dull ochreous. Forewings elongate triangular, costa almost straight, termen oblique, hardly bowed; cinereous-grey; markings reddish-ferruginous; a moderately broad fascia from one-fourth costa to one-fourth inner margin, with a strong projection outwards in middle; a similar fascia from five-sixths to two-thirds of inner margin, indented beneath costa and strongly curved inwards in middle, angles rounded; a short oblique dash just before apex; a blackish patch above anal angle; some blackish scales before termen; cilia grey, becoming cinereous at base, with a fuscous subterminal line. Hindwings with termen faintly sinuate below apex; grey on basal half, becoming broadly light fuscous along termen; cilia grey with a fuscous basal line.

Allied to the following, but very distinct by the transverse fasciæ and clearness of markings.

Broken Hill, New South Wales; two specimens in August.

Eclipsiodes crypserythra, n. sp.

Male, 20 mm. Head, palpi and thorax grey-whitish, somewhat mixed with reddish, palpi beneath white. Antennæ fuscous, spotted with white, abdomen greyish-ochreous, second segment orange-red. Legs whitish, tarsi irregularly banded and fuscous. Forewings shaped as in *anisophragma*; grey-whitish, more or less suffusedly irrorated with fuscous and with some reddish scales; markings fuscous, obscurely defined; a small spot at base; a narrow, slightly oblique fascia, from one-quarter costa to beyond one-quarter of inner margin; ground color between base and fascia tinged with reddish; a similar fascia from costa at five-sixths to inner margin at two-thirds, slightly dentate and with a rounded projection above middle;

a short oblique dash just before apex; a moderate, straight, longitudinal dull ochreous or reddish streak above middle, from base direct to projection of second fascia, attenuated anteriorly and dilated posteriorly; a similar streak along fold; veins towards termen outlined in similar color; a moderately clear streak of ground color before termen; a few blackish scales along termen; cilia greyish, with a well-defined row of black spots at base and a fuscous subterminal line. Hindwings with termen rounded, faintly sinuate below apex; very pale ochreous, becoming broadly light fuscous around termen, but leaving a moderate streak of ground color along termen; cilia light greyish-ochreous, with a fuscous basal line.

Allied to the preceding but easily distinguished by the longitudinal streak, spotted cilia of forewings, palpi being white beneath and the pale ochreous hindwings. The streak of ground color before termen on both wings is a curious character; this and the spotted cilia of forewings are better discerned beneath.

Broken Hill, New South Wales; nine specimens in July and August.

EROMENE OCELLEA, Haw.

I have recently captured specimens of this European species at Broken Hill, New South Wales, in August, and have also received specimens from Roeburne, Western Australia. Some years ago I gave the late Mr. E. Guest, of Balhannah, South Australia, a specimen of what I believe was this species, and later Mr. Meyrick stated that he received a specimen from that gentleman, who took it at Mount Lofty, S.A. However, there can be no doubt about the present specimens, and it can now be added to the Australian fauna.

TORTRICINA.

LOMASCHIZA, n. g.

Thorax with dense bifid posterior crest. Antennæ of male serrate, very shortly ciliated at joints. Palpi very short, porrected, second joint triangularly scaled, terminal joint nearly concealed. Forewings elongate, moderate, costa of male with a swollen membranous ridge beyond middle; termen obliquely rounded; 7, 8, and 9 closely approximated at base, 7 to termen, 2 from lower angle of cell, remote from 3; 3 and 4 closely approximated at base, 10 and 11 strongly curved, 11 running along lower edge of ridge. Hindwings broader than forewings, costa strongly arched in middle, termen in male strongly emarginate below apex (causing apex to appear very prominent), and indented on vein 1; 6 and 7 somewhat approximated at base, 3 and 4 from a point, 5 approximated to 4

at base; in the female the wing is normal, *i.e.*, with the termen rounded.

A remarkable genus, not near any other known to me. The curious ridge on costa of male and aborted hindwings make it a conspicuous genus.

LOMASCHIZA PHYSOPHORA, n. sp.

Male and female, 10-14. Head, thorax, antennæ, and abdomen ochreous-fuscous. Palpi whitish, beneath fuscous. Face whitish. Legs fuscous, anterior coxæ dark fuscous. Forewings elongate, moderate, costa faintly sinuate in middle, termen obliquely rounded; ochreous-fuscous; 3 leaden-metallic spots on inner margin, first at one-sixth from base reaching half across wing, preceded by a waved narrow oblique dark fuscous line from costa near base to inner margin at one-sixth; second before middle, somewhat triangular, reaching more than half across wing, anterior edge dentate, dentation filled with blackish and preceded by an oblique clear whitish line; a similar line along posterior edge of spot; third small, erect, elongate, just before anal angle; a sharply defined oblique black streak from costa beyond middle to middle of wing, posteriorly edged with leaden-metallic, becoming sinuate outwards at termination, sinuation filled in with black, sometimes continued as a fine whitish line to anterior edge of third leaden spot; ground color between streak and triangular spot on inner margin more ochreous; a very large space of light fuscous between sinuation and termen, encircled by a whitish-ochreous ring, which almost touches a similar blackish centred very small ring just below apex; 7 pairs of whitish costal strigulæ, first two pairs just above triangular patch; cilia ochreous-fuscous. Hindwings with termen in male strongly sinuate in middle, in female rounded; grey-whitish, very thinly scaled in male, dark fuscous in female.

Cooktown, Queensland; three specimens in June. I have seen a specimen from Mackay.

PYRGOTIS (?) CALLIZYGA, n. sp.

Female, 20 mm. Head, thorax, antennæ, and abdomen dark fuscous, patagia ochreous-yellowish. Palpi ochreous-fuscous. Legs ochreous. Forewings elongate-triangular, costa rather strongly arched, termen obliquely rounded, sinuate beneath apex, hardly produced; ochreous-yellow, with dark fuscous markings; a broad basal fascia, continued along inner margin to median fascia, with a projection above inner margin at one-fourth, leaving a spot of ground color at base; median fascia moderately broad, oblique, somewhat dilated on costa, from costa in middle to posterior extremity

of streak along inner margin; a moderate triangular spot on costa at three-quarters; an erect fascia from anal angle reaching two-thirds across wing, apex irregular; a fuscous blotch just above inner margin, connecting median and last-mentioned fasciæ; an elongate fuscous spot on upper half of termen, more or less continued to apex; cilia yellowish, on upper half fuscous with whitish tooth at apex. Hindwings with termen rounded, faintly sinuate beneath apex; 3 and 4 remote, 5 very widely remote, midway between 4 and 6; dark bronzy-fuscous, faintly spotted with darker; cilia light fuscous, with a darker basal line. Underside of hindwings yellowish, spotted with fuscous.

Doubtfully referable to *Pyrgotis*; it approaches *Acropolitis* somewhat, but appears distinct from either of these genera by the curious neuration of hindwings. I would have formed a new genus for its reception, but in the absence of the male it seems wiser to defer doing so for the present.

Mount Gambier, South Australia; one specimen in November.

SYNTOZYGA, n. g.

Thorax with a small posterior crest. Antennæ in male strongly biserrate, shortly ciliated. Palpi moderate, somewhat arched, thickened with appressed scales, terminal joint short, exposed, about one-third of second. Forewings elongate, moderate, slightly narrower than hindwings, surface somewhat roughened; costa simple, nearly straight, termen obliquely rounded, secondary cell very small, distinct, all veins separate, 7 to termen, vein 1 furcate at base, 3 from angle, remote from 4, 6 and 7 widely remote. Hindwings with 3 and 4 somewhat connate, 5 curved, remote from 4, 6 and 7 long stalked.

Somewhat allied to *Palaeotoma*, but differs by the crested thorax, biserrate antennæ, short terminal joint of palpi, separation of veins 7 and 8 of forewings and well marked secondary cell. This latter character is not of much value.

SYNTOZYGA PSAMMETALLA, n. sp.

Male, 10 mm. Head, palpi, thorax, legs, and antennæ ochreous, second joint of palpi very short. Abdomen greyish-ochreous. Forewings elongate, moderate, costa nearly straight, termen obliquely rounded; ochreous, finely and transversely strigulated with ferruginous; costa shortly and obliquely strigulated with ferruginous; outer edge of basal patch limited by a narrow ferruginous fascia, from one-third costa to one-fourth inner margin, angulated outwards in middle; median patch moderately broad, nearly straight, from middle

of costa to beyond middle of inner margin, edges obscurely defined; some leaden-metallic scales between fascia and patch; some similar scales in posterior edge of fascia near costa, and more or less continued to inner margin before anal angle, where it becomes blotch-like and edged posteriorly with ferruginous; an irregularly curved ferruginous streak, from costa just beyond posterior edge of median patch to below middle of termen, dilated in middle; a small triangular ferruginous spot at apex, with a darker spot at its lower extremity; cilia ochreous, base darker. Hindwings with the termen rounded, faintly sinuate beneath apex; greyish; cilia as in forewings.

Cooktown, Queensland; two specimens in January.

Polylopha, n. g.

Thorax smooth. Antennæ in male somewhat dentate, thickened, very shortly ciliated. Palpi moderate, straight, porrected, second joint triangularly scaled, terminal joint exposed, short. Forewings elongate, moderate, rather narrow, surface with raised tufts of scales, costa simple, arched at base, termen oblique, nearly straight; 2 from beyond two-thirds, 3 and 4 from angle, closely approximated, 7 and 8 separate, 7 to costa. Hindwings broader than forewings, termen faintly sinuate beneath apex; 3 and 4 from a point, 6 and 7 separate.

Differs from *Palaeotoma*, to which genus it is not very near, by the separation of veins 6 and 7 of hindwings and vein 7 of forewings running to costa.

Polylopha epidesma, n. sp.

Male, 16 mm. Head, palpi, and thorax cinerous-grey, second joint of palpi beneath white, with some black spots at apex. Antennæ fuscous. Legs whitish, anterior tarsi banded with blackish. Abdomen greyish-fuscous. Forewings moderate, costa arched at base, thence nearly straight, termen faintly sinuate beneath apex, oblique, nearly straight; ashy-grey-whitish, mixed with greenish-leaden, and strewn with numerous tufts of ashy-grey-scales, which become blackish posteriorly; a short oblique blackish streak at base, not reaching costa; an oblique fuscous streak from costa at one-fourth, reaching fold; a tuft of scales immediately between; a suffused fuscous spot on costa, indicating commencement of second fascia; a narrow longitudinal black line along fold, from base to termen above anal angle, becoming dot-like on anterior half; a broad suffused black transverse fascia, from costa at three-fourths to extremity of longitudinal streak, becoming dilated on lower half, sometimes obsolete on upper half; 4 or 5 blackish dots on costa between anterior extremity of last fascia and apex; some fine black scales on middle of

termen; cilia ashy-grey-whitish, with some blackish scales at base. Hindwings with termen rounded; sinuate beneath apex, apex prominent; dark fuscous, lighter on basal half; cilia dark fuscous, with a fuscous subterminal line, basal line greyish.

The black longitudinal streak recalls *Palaeotoma styphelena*, Meyr.

Mackay, Queensland; two specimens in April.

Temnolopha, n. g.

Thorax with dense posterior bifid crest. Antennæ in male somewhat serrate, shortly ciliated. Palpi rather long, porrected, second joint triangularly scaled, terminal joint short, distinct. Posterior tibiæ thickened in male. Forewings elongate, moderate, costa simple in male, gently and evenly arched, termen nearly straight. Hindwings broader than forewings. Forewings with secondary cell distinct, 7 and 8 separate, 7 to termen, 3 and 4 remote at base, 3 somewhat curved. Hindwings with 3 and 4 from a point, 5 approximated to 4 at base, 6 and 7 separate.

Somewhat allied to *Arotrophora*, Meyr., but differs essentially by the crested thorax, absence of costal fold and shorter ciliations of antennæ.

Temnolopha mosaica, n. sp.

Male and female, 15-22 mm. Head, palpi, and thorax ochreous-grey, mixed with reddish, thorax with a dense reddish bifid posterior crest, palpi beneath whitish. Antennæ and abdomen fuscous-grey, beneath whitish. Legs whitish, tarsi suffusedly banded with blackish. Forewings elongate, moderate, costa gently arched, termen hardly oblique, nearly straight; dull olive-greenish, sometimes strongly mixed with ferruginous, except beneath costa; costa shortly and obliquely strigulated with ferruginous and whitish; outer edge of basal patch represented on lower half by an irregular oblique wedge-shaped dark ferruginous patch, apex reaching to one-quarter in middle on inner marginal edge is a tuft of somewhat raised scales; a broad fuscous-greenish post-median fascia, not near reaching costa, anterior edge from beyond middle, with a rounded projection on upper angle, thence deeply sinuate and irregularly continued round to anal angle, where it touches a small erect fuscous patch, which indicates posterior extremity of fascia; a greenish-fuscous somewhat lunate mark just above the erect patch, faintly edged above with whitish; ground color between this and anal angle fleshy white; a small blackish spot at apex; a few black scales along termen; cilia olive-greenish mixed with fuscous, becoming grey-whitish around

anal angle. Hindwings dark fuscous, somewhat bronzy; cilia fuscous, with a darker subbasal line.

Mackay, Cooktown, and Townsville, Queensland; three specimens in January and February.

Temnolopha metallota, n. sp.

Male, 18 mm. Head, palpi, and thorax purplish, thorax with a dense reddish-fuscous posterior crest. Antennæ ochreous. Legs greyish. Forewings elongate, moderate, costa gently arched, termen obliquely rounded, veins 7, 8, 9 are closely approximated at base, 8 and 9 are almost from a point from angle, in *mosaica* 9 is from well beyond the angle; dull bluish-purple; costa obiquely strigulated with fine short fuscous and white strigulæ; a fine fuscous line from costa at one-third to inner margin at one-third, evenly curved outwardly on upper three-fourths, and with an indentation just above inner margin, ground color between this and base finely and transversely strigulated with waved fuscous lines; an irregular transverse ferruginous patch, from costa beyond middle to inner margin beyond middle, much narrowed on lower half, containing a few blackish scales just above inner margin; two moderate irregular transverse ferruginous fasciæ, first from five-sixth costa to anal angle, containing two short fine longitudinal black streaks above anal angle; second from apex to middle of termen, leaving one or two whitish teeth on termen; a fine fuscous line along upper half of termen; cilia fuscous, on lower half grey-whitish, separation distinct. Hindwings with termen rounded, faintly sinuate beneath apex; ochreous-fuscous; cilia greyish, with a fuscous line near base.

At first sight not unlike *Carpocapsa pomonella*. Lin.

Cooktown, Queensland; two specimens in June.

Sorolopha, n. g.

Thorax with a dense posterior crest, not bifid. Antennæ serrate, very shortly ciliated. Palpi short recurved, oppressed to face, terminal joint very short, nearly concealed. Abdomen in male densely haired, and with a moderately erect tuft of hairs on anterior segment, tibiæ in male broadly dilated, coxæ with an expansible tuft of hairs at base. Forewings and hindwings with neuration as in *Temnolopha;* termen obliquely rounded.

Differs from *Temnolopha* only by the crest on anterior segment of abdomen, different palpi, ciliations of antennæ, which are hardly perceptible, different crest of thorax and especially by the large tuft of hairs on posterior legs. It at first considered these characters specific only, but it seems desirable on reconsideration to form a new genus for the reception of the following species.

SOROLOPHA CYCLOTOMA, n. sp.

Male and female, 17-22 mm. Head, palpi, antennæ, and thorax deep reddish-fuscous, thorax with a dense deep reddish posterior crest. Abdomen deep ochreous-fuscous, in male densely haired with golden ochreous, especially on anterior segments. Forewings elongate, moderate, costa gently arched, termen rounded, oblique; deep olive-greenish mixed with fleshy-pink; costa shortly strigulated throughout with fuscous; outer edge of basal patch represented by an erect triangular blackish patch on inner margin at one-fourth, reaching two-thirds across wing, edged posteriorly by a fine line of fleshy-white; ground color between apex of patch and costa fleshy-pink; posterior edge of median patch well defined, edged throughout by a fine fleshy-white line, from costa beyond middle direct to anal angle, faintly sinuate above middle; ground color between this and triangular patch deep olive-green, becoming broadly mixed with flesh color above inner margin; ground color between posterior edge of median patch and apex fleshy pink, mixed with purplish and containing a large round fuscous reddish patch above middle, lower edge suffused; a deep purplish line along upper half of termen, becoming forked at apex; cilia fuscous purple, mixed with fuscous on upper two-thirds. Hindwings with termen rounded, dark golden-ochreous, lighter towards base; cilia ochreous-fuscous, with a darker subbasal line. The ochreous coloring of hindwings is more pronounced beneath.

Mackay, Queensland; four specimens in January.

CAPUA LEPTOSPILA, n. sp.

Male, 18 mm. Head and palpi whitish, palpi beneath infuscated. Abdomen greyish. Antennæ and thorax fuscous, antennæ obscurely spotted with whitish. Legs fuscous, middle and posterior pair whitish-ochreous. Forewings elongate, moderate, costa nearly straight, termen oblique, gently rounded; whitish-ochreous, spotted throughout with fuscous; markings dark fuscous; costa shortly strigulated throughout with fuscous; outer edge of basal patch from one-fifth costa to one-eighth inner margin, upper half oblique, with a fine projection on fold, thence inwardly oblique and rapidly attenuated to inner margin; an elongate quadrate spot lying on inner margin at one-fourth; median fascia oblique, from before middle of costa to anal angle, becoming much dilated on inner margin, anterior edge nearly straight, with a moderate sinuation below fold; posterior edge with a moderate sinuation about middle, thence irregular; an elongate streak from posterior extremity of median patch to above middle of termen, leaving a strip of ground color along termen; a moderate trian-

gular patch on costa at three-fourths, containing two pairs of short white strigulæ, and 3 darker fuscous equidistant dots on costa; a spot at apex; cilia greyish, barred with fuscous on basal half. Hindwings with termen rounded; greyish, spotted with fuscous, so as to appear greyish-fuscous; a fine fuscous line along upper half of termen; cilia greyish, with a darker basal line.

Distinct and clearly marked; perhaps nearest *Sordidatana*, Meyr.

Broken Hill, New South Wales; one specimen in May

CAPUA PENTAZONA, n. sp.

Female, 16 mm. Head, palpi, antennæ, and thorax dark fuscous, palpi beneath white, sharply defined, antennæ obscurely annulated with whitish, thorax with a whitish spot on posterior extremity, patagia whitish. Legs whitish, all tarsi black, ringed with whitish. Forewings elongate, triangular, costa moderately arched, termen oblique, rounded beneath; dark fuscous, more or less sprinkled with whitish; five transverse black fasciæ, all finely inorated with greenish white; first, indicating edge of basal fascia, from one-sixth costa to one-fourth inner margin, gently curved outwards; second slightly curved outwards beneath costa, from costa at one-fourth to before middle of inner margin; ground color between first and second fasciæ strongly irrorated with whitish; third nearly straight, from just before middle of costa to before middle of inner margin; fourth parallel, just beyond; fifth parallel, from costa at three-fourths to anal angle; the last two fasciæ are interrupted by a well-defined broad oblique whitish fascia, from immediately beyond third fascia to anal angle, cutting fourth fascia in middle; three oblique whitish spots on costa between posterior edge of white fascia and apex; a black streak, strongly irrorated with whitish along termen; cilia fuscous, mixed with blackish. Hindwings with termen rounded, faintly sinuate beneath apex; fuscous, spotted with darker fuscous; cilia greyish, with a fuscous subbasal line.

Nearest *decolorana*, Walk, but immediately distinguished by the fuscous hindwings. The description of *Asthenoptycha conjunctana*, Walk., would seemingly indicate an insect of similar appearance, but the palpi of this species would alone remove it from that genus.

CAPUA PANXANTHA, n. sp.

Female, 16-20 mm. Head, palpi, antennæ, thorax, and abdomen yellow-ochreous. Legs somewhat paler. Forewings elongate, moderate, costa strongly arched, termen gently bowed, oblique, faintly sinuate beneath apex; yellowish-

ochreous, finely strigulated throughout with darker ochreous mostly arranged in transverse series; outer edge of basal patch hardly perceptible, except on margins; median patch narrow, oblique; dull ferruginous, from costa before middle to just before anal angle; an obscure oblique dull ferruginous fascia from costa at five-sixths to middle of termen; cilia pale ochreous. Hindwings with termen rounded; 5 remote from 4; ochreous-yellow; cilia as in forewings.

Allied to *melichroa*, Lower; but apart from its much smaller size, it may be at once distinguished by the ochreous hindwings.

Cooktown, Queensland; several specimens in November.

DICHELOPA, n. g.

Thorax smooth. Antennæ in male thickened, somewhat dentate; shortly ciliated. Palpi moderate, porrected, second joint triangularly scaled, terminal joint hardy concealed. Forewings elongate-oblong, costa in male simple, gently and evenly arched, termen rounded oblique, 1 furcate at base, 3 and 4 short stalked, 7 and 8 stalked, 7 to immediately above apex. Hindwings with 7 veins, termen faintly sinuate beneath apex; 4 absent, coincided with 3, 3 rather approximated to 5, 6 and 7 tolerably remote at origin.

Not near any other Australian genus known to me, the neuration of forewings, and absence of vein 4 of hindwings are distinctive characters; a similar character occurs in the European genus *Cheimatophila*, Stph. Its resemblance to *Dichelia* is superficial only.

DICHELOPA DICHROA, n. sp.

Male and female, 14-16 mm. Head, palpi, antennæ and thorax ochreous-ferruginous. Abdomen dark fuscous, beneath ochreous. Anterior and middle legs ochreous-fuscous, posterior pair ochreous, tarsi with fuscous rings. Forewings elongate, moderate, costa gently arched, termen oblique, rounded; deep ochreous, with irregular transverse rows of leaden-metallic spots; markings reddish-fuscous; a basal patch, strongly suffused with ground color at base and on inner margin, outer edge from costa at one-fifth to inner margin at one-fourth, with a slight projection in middle; a broad streak along costa, from just beyond one-third to three-fourths of wing, thence becoming confluent with a large apical patch, ending on termen at three-fourths, enclosing on costal edge 4 well defined spots of ground color, anterior large, posterior 3 close together near apex; a large spot on inner margin at anal angle, reaching half across wing, separated from costal streak by a streak of ground color; a row of about 6 suffused ochreous spots along termen, posteriorly edged by minute leaden-metallic

spots; cilia ochreous, becoming fuscous around anal angle. Hindwings with termen rounded; dark fuscous; cilia fuscous; with a darker fuscous subbasal line.

Goolwa and Port Victor, South Australia; six specimens in November.

BYRSOPTERA, n. g.

Thorax with a very small posterior bifid crest. Antennæ in male serrate, shortly ciliated. Palpi short, porrected; second joint triangularly rough scaled, terminal joint almost concealed. Forewings moderate, elongate, costa in male simple, hardly arched, termen obliquely rounded; 7 and 8 separate, 7 to termen, secondary cell distinct, vein 10 strongly curved in middle. Hindwings slightly broader than forewings, costa very strongly arched in middle, termen faintly sinuate; 3 and 4 from a point, 5 widely remote, parallel to 4, 6 and 7 separate.

In the neighborhood of *Dipterina*, but the antennæ and separation of veins 6 and 7 of hindwings are distinct from that genus.

BYRSOPTERA XYLISTIS, n.sp.

Male and female, 8-10 mm. Head whitish-ochreous, thorax, palpi, and antennæ light fuscous. Abdomen dark fuscous. Legs fuscous-whitish. Forewings moderate, costa hardly arched, termen obliquely rounded; light fuscous, finely irrorated with darker fuscous; costa shortly strigulated with fuscous; 3 moderately oblique fuscous fasciæ, first close to base, not reaching inner margin; second at one-fourth of costa to one-fourth of inner margin, continued to inner margin below middle as a fine line; third entire, from middle of costa to beyond middle of inner margin, with a strong projection outwards in middle; an erect fuscous triangular spot on inner margin at anal angle, indicating posterior extremity of a fourth fascia; a short oblique fuscous spot at anal angle; a small fuscous subapical spot; a fine fuscous line along upper half of termen; cilia greyish-fuscous, at base ochreous fuscous. Hindwings with costa strongly arched in middle; pale greyish, thinly scaled; cilia light fuscous.

A neatly marked insect, and easily recognised.

Cooktown, Queensland; three specimens in November. I have also seen specimens from Mackay and Townsville; Queensland.

TINEINA.

GELECHIADÆ.

DORYCNOPA, n. g.

Head smooth. Palpi moderate, second joint somewhat triangularly scaled, terminal joint erect, as long as second,

thickened with appressed scales. Antennæ strongly serrate, shortly ciliated in male, hardly 1. Forewings lanceolate-linear, apex pointed, costa faintly sinuate in middle; 3, 4, 5 and 6 widely remote at origin, parallel, equidistant; 7 and 8 out of 6; 9 separate. Hindwings almost 1. Termen strongly emarginate, apex produced; 3 from before angle, 4 from angle, 5 widely remote, parallel to 4, equidistant between 4 and 6, 6 closely approximated to 7 at base.

Differs from *Paltodora*, Meyr., by veins 4 and 5 of forewings being widely remote at base (in that genus they are remote, but not near so widely), the relatively broadly forewings, sinuate costa, and approximation of veins 6 and 7 of hindwings.

Dorycnopa acroxantha, n. sp.

Male, 14 mm. Head, thorax, palpi, antennæ legs and abdomen reddish ochreous, thorax with a large whitish posterior spot, second joint of palpi internally white, antennæ annulated with whitish, posterior legs greyish-ochreous. Forewings elongate-lanceolate, costa faintly sinuate in middle, apex pointed; reddish-ochreous; a narrow transverse oblique ochreous fascia, from costa at one-fourth towards inner margin but not reaching it; ground color between base and fascia darker and appearing raised on edge of fascia; a similar fascia, slightly inwards curved and containing a fine black mark in middle, from costa at four-fifths to before anal angle, ground color darker between posterior extremity and termen; an obscure suffused blackish streak below middle, preceding anterior edge of last fascia; an obscure blackish dot placed on a small spot of lighter ground color midway between the two fasciæ; cilia ochreous-reddish, mixed with fuscous and dark fuscous, becoming wholly ochreous around anal angle. Hindwings with termen emarginate, apex produced; light fuscous; cilia two and a half, ochreous, becoming greyish on terminal third.

Exeter, South Australia; three specimens in December.

Stenopherna, n. g.

Head smooth. Palpi somewhat porrected, roughened with scales, terminal joint one-third of second, acute Antennæ somewhat dentate, ciliations hardly one-half in male. Posterior tibiæ clothed with short hairs. Forewings elongate-lanceolate, apex pointed; 3 and 4 widely remote at base, nearly equidistant with 5 and 6, 6 separate, 7 and 8 stalked, 7 to costa. Hindwings narrower than forewings; elongate-trapezoidal, apex pointed, produced, termen emarginate; 3, 4, and 5 approximated at base; cilia 3.

Also somewhat allied to *Paltodora*, Meyr., but differs bv the very short terminal joint of palpi, shorter ciliations of antennæ and separation of veins 6 and 7 of hindwings.

Stenopherna chionocephala, n. sp.

Male and female, 8-11 mm. Head white. Antennæ one-half, fuscous-whitish, palpi fuscous, terminal joint white. Legs fuscous, irrorated with white, tarsi black, ringed with white. Thorax white, somewhat infuscated. Abdomen fuscous. Forewings elongate-lanceolate, apex pointed; dull white, markings fuscous; a basal patch, outer edge nearly straight, from one-sixth costa to one-sixth inner margin; an irregular quadrate spot on inner margin at one-fourth; an irregular trapezoid blotch on costa before middle, reaching three-fourths across wing; an irregular blotch just before apex, reaching across wing to anal angle, sometimes separated into 2 spots by a streak of ground color; some black scales at apex; cilia whitish, finely inorated with black points, especially at base and extremities. Hindwings elongate-trapezoidal, narrower than forewings, apex pointed, produced, termen emarginate; light grey; cilia 1, greyish-ochreous.

Broken Hill, New South Wales; several specimens in October; usually taken at light.

Bactrolopha, n. g.

Head smooth. Antennæ serrate, ciliations nearly 1. Palpi moderate, nearly straight, densely rough scaled above and below, terminal joint hardly recurved, almost as long as second, roughly scaled above and below. Posterior tibiæ clothed with long hairs. Forewings elongate, lanceolate, narrow, pointed; 4 and 5 connate or short stalked; 7 and 8 out of 6, 9 out of 8 near base, 7 and 8 long-stalked, both to costa (vein 8 is not well developed). Hindwings almost 1, elongate-trapezoidal, termen emarginate, apex pointed, produced; 3 and 4 approximated at base, 4, 5, and 6 remote at base, nearly parallel; cilia 3.

Bactrolopha orthodesma, n. sp.

Male and female, 8-12 mm. Head, palpi, and thorax white, palpi externally ochreous-tinged. Antennæ three-fourths, white, annulated with fuscous; ciliations nearly 1. Abdomen whitish-ochreous, more ochreous on basal segments; in male black. Legs white, tibiæ and tarsi ochreous, terminal tarsi fuscous. Forewings elongate-lanceolate, narrow, pointed; white; three moderately broad suffused pale ochreous equidistant fasciæ, irregularly edged; first from one-sixth costa to one-sixth inner margin; second before middle of costa to before middle of inner margin; third from five-sixths costa to two-thirds of inner margin; a suffused pale ochreous line along termen; cilia white, sprinkled with fine black scales. Hindwings narrower than forewings, elongate-trapezoidal, termen

emarginate, apex pointed, produced; grey-whitish; in male blackish; cilia white.

The variation of color of abdomen and hindwings of male is noticeable.

Broken Hill, New South Wales; four specimens in October.

PYCNOBATHRA, n. g.

Head smooth. Antennæ dentate, nearly three-fourths, ciliations 1. Palpi moderate, second joint more or less dilated with long rough spreading hairs beneath, terminal joint as long as second, recurved, apex acute. Posterior tibiæ somewhat rough haired. Forewings elongate, somewhat lanceolate, apex pointed; 7 and 8 stalked, both to costa, 2 from beyond three-fourths, 3 from angle, 4 widely remote from 3, parallel. Hindwings as broad as forewings; elongate-trapezoidal, apex acute, produced, termen strongly sinuate; cilia over 1; 3 and 4 somewhat approximated at base, 5, 6, and 7 widely remote, parallel.

The dense tuft on the second joint of palpi is very noticeable.

PYCNOBATHRA ACHROA, n. sp.

Male and female, 9-11 mm. Head yellowish ochreous. Thorax ochreous-fuscous, patagia ochreous. Abdomen blackish, anal tuft greyish. Antennæ fuscous. Palpi ochreous-whitish, second joint fuscous laterally and beneath. Legs blackish, posterior pair ochreous-whitish. Forewings elongate-lanceolate, apex pointed; ochreous, sometimes fuscous tinged; a narrow whitish costal streak, attenuated at extremities from base to beyond middle, in pale specimens lost in general ground color; a small ferruginous spot in middle, at one-third from base; a second below and beyond, both usually obsolete; a few fuscous scales towards anal angle; cilia ochreous. Hindwings elongate trapezoidal, apex acute, produced; greyish fuscous; cilia as in forewings, but becoming darker towards base.

Broken Hill, New South Wales; not uncommon in October and November.

ASTHALISTIS EUCHROA, Lower

(PROC. LINN. SOC., N.S.W., P. 47. 1900).

I have recently seen specimens of this species from Townsville, Queensland,, in which the ground color of forewings is greenish, the markings are, however, identical.

YPSOLOPHUS OCHROLOMA, n. sp.

Female, 14 mm. Head and palpi white, second joint of palpi fuscous beneath. Thorax fuscous-whitish, patagia ochreous.

Antennæ and legs fuscous, club of antennæ white beneath. Abdomen greyish-fuscous, two anterior segments yellow. Forewings elongate, moderate, costa nearly straight, apex pointed; dark fuscous, suffusedly irrorated with white; markings dark fuscous; a fine streak along lower edge of cell, from near base to posterior extremity, somewhat interrupted before middle; a short ochreous dash beneath anterior extremity; a streak of ochreous before termen from near apex to anal angle, containing 2 black spots near apex, and edged anteriorly throughout by an obscure line of fine blackish scales; veins more or less outlined with fuscous; cilia light fuscous, with median and terminal white lines, more pronounced towards and around apex. Hindwings with termen emarginate, apex pointed; light-fuscous; cilia greyish-fuscous, becoming ochreous at base.

Allied to *trichombrous*, Lower, but differs by fuscous lines of forewings, and especially by the ochreous streak before the termen, a character not shared by any of its allies, and which distinguishes it at once.

Broken Hill, New South Wales; eight specimens in August and September.

YPSOLOPHUS ARGONOTA, n. sp.

Male and female, 10-12 mm. Head, thorax, palpi, legs and antennæ white, antennæ mixed with fuscous on terminal half. Abdomen whitish, two anterior segments pale ochreous. Forewings elongate, moderate, costa nearly straight, apex pointed; 7 and 8 out of 6; white, very minutely irrorated with blackish throughout, leaving costal edge obscurely white; cilia ochreous-whitish, with a few blackish scales at base. Hindwings with termen emarginate, apex pointed, produced; light fuscous; cilia greyish-ochreous.

Known from its allies by the absence of any definite markings and whitish coloring. It is nearest *cycnoptera*, Lower, but differs in its smaller size and absence of longitudinal white median streak.

Broken Hill, New South Wales; three specimens in October

I formerly regarded this species, and its allies as species of *Paltodora*, Meyr., but Mr. Meyrick referred them to the present genus, and although the characters do not agree with those given in his "Handbook of British Lepidoptera," I place them here until the group is revised. All those I have recently examined from this region have veins 7 and 8 out of 6, and 2 and 3 widely remote at base; the hindwings (which are emarginate) having 3 and 4 connate, 5 somewhat approximated to 4, and 6 and 7 stalked. This latter character would separate them from *Paltodora*. The following species is very different in appearance, and the neuration is quite different, *i.e.*, 2 and 3 and 7 and 8 of forewings are stalked, and hind-

wings are trapezoidal with termen hardly sinuate, but the neuration is similar to those previously described of similar appearance.

YPSOLOPHUS THANATOPSIS, n. sp.

Male, 12 mm. Head, palpi, thorax, abdomen, and antennæ ochreous grey; palpi paler internally, second joint black externally, antennæ spotted with blackish. Legs blackish, posterior pair mixed with grey. Forewings elongate, moderate, somewhat dilated posteriorly, costa gently arched, termen obliquely rounded; 2 and 3 stalked; greyish-fuscous, slightly paler along costa, minutely dotted with darker fuscous dots, 3 arranged in a longitudinal series on fold at one-fourth, before and beyond middle, more conspicuous; a row of small black dots along termen; cilia greyish-fuscous. Hindwings with termen hardly sinuate; dark fuscous; cilia as in forewings.

Closely allied to *dryina*, Lower, but differs by its much smaller size, dots along termen and color of hindwings.

Cooktown, Queensland; two specimens in February.

XYLORYCTIDÆ.

MAROGA PARAGYPSA, n. sp.

Male, 40 mm. Head, palpi, thorax, and antennæ creamy-white, terminal joint of palpi less than one-half of second. Abdomen orange, darker on posterior segments, white beneath. Legs ochreous-whitish, middle and posterior tibiæ orange, tarsi of anterior legs blackish. Forewings elongate-oblong, costa slightly arched towards base, termen rather obliquely rounded: 7 to apex, 3 from just before angle; creamy-white, sparsely irrorated with some minute blackish scales, which become somewhat ochreous towards base; cilia white. Hindwings and cilia creamy white, basal and inner marginal areas clothed with long yellowish hairs.

Between *setiotricha*, Meyr., and *unipunctana*, Don, but not very near either.

Roeburne, Western Australia; one specimen. (Type in *Coll. Lyell*).

CRYPTOPHAGA HYALINOPA, n. sp.

Male, 30 mm. Head, palpi, thorax, and legs fleshy-ochreous, head somewhat pinkish tinged, tarsi ringed with blackish. Antennæ blackish, pectinations 2. Abdomen blackish, second segment orange-red. Forewings elongate, moderate, costa nearly straight, termen obliquely rounded; fleshy-ochreous, darker on basal third; a fine black dot in disc at one-third, a second at posterior extremity of cell, and a third obliquely below and before; two others on fold beyond middle; an obscure row of fine blackish dots along termen to anal angle, not reaching apex.

Hindwings semi-hyaline, basal two-thirds black; cilia whitish becoming fuscous around anal angle. Underside of both wings with basal two-thirds densely black.

Nearest *balteata*, Walk., but very distinct by the curious semi-hyaline hindwings. I received this species from the late Mr. G. Barnard as *sarcinota*, Meyr., but having now received that species I find that there is a very great difference between the two.

Duaringa, Queensland; one specimen in October.

Cryptophaga panleuca, n. sp.

Male, 34 mm. Head, palpi, antennæ, legs, thorax, and abdomen white, antennæ pectinations 4, second segment of abdomen orange red, remainder of segment narrowly orange. Forewings elongate-oblong, costa gently arched, termen rounded, oblique; 2 from considerably before the angle; white, without markings; cilia shining white. Hindwings shining snow white; a row of black dots along termen; cilia snow white.

Similar in appearance to *epadelpha*, Meyr., but the white hindwings separate it at once from that species.

Cooktown, Queensland; one specimen (? taken in October).

Xylorycta pentachroa, n. sp.

Male, 34 mm. Head, antennæ, and thorax whitish, thorax with a broad black longitudinal stripe. Antennal ciliations 1. Palpi and legs ochreous. Palpi very short. Abdomen blackish, segmental margins dull ochreous. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; 2 from three-fourths; fleshy-ochreous, markings orange suffusedly edged with blackish scales; a moderate spot in disc at one-third from base; a second, elongate, obliquely below and beyond, and 2 others moderately, obliquely placed beyond posterior extremity of cell; some fine blackish scales on area of makings; 3 and 4 stalked; 6 and 7 stalked; cilia dark fuscous. Hindwings yellow, becoming darker towards termen; cilia dark fuscous.

The markings of this species are similar to those on *Blackburnii*, Lower, but the coloring is very different. The very short palpi recalls *neomorpha*, Turner.

Broken Hill, New South Wales; one specimen in December.

Xylorycta cephalochra, Lower.

I have received a specimen from Cooktown, Queensland, in which veins 7 and 8 of forewings are coincident, a curious variation.

LICHENAULA OMBRALOTA, n. sp.

Female, 24 mm. Head and thorax snow-white (palpi broken). Antennæ fuscous. Legs whitish. Abdomen greyish, beneath whitish, segmental margins, narrowly dull orange. Forewings elongate, moderate, costa gently arched, apex round pointed, termen sinuate beneath apex, hardly rounded; 2 from two-thirds, 7 to apex; dark fuscous, suffusedly mixed with whitish and black scales; a broad white costal streak from base to apex, attenuated at extremities and broadly interrupted by ground color at two-thirds; a somewhat dot-like fuscous streak, from posterior extremity of ground color interrupted along costa to apex and continued as a fine line along termen to anal angle; veins towards termen outlined in black and edged with whitish; a suffused ferruginous spot on fold at one-third, edged posteriorly by a similar-sized white spot; a similar white spot beyond extremity of cell; cilia whitish, light fuscous on basal half, and with a very distinct blackish terminal line around apical portion. Hindwings fuscous; cilia as in forewings.

Nearest *undulatella*, Walk.

Bairnsdale, Victoria; one specimen, in January.

XYLORYCTA TETRAZONA, n. sp.

Female, 30 mm. Head and palpi orange-yellow. Antennæ fuscous, basal joint yellow. Thorax white, with a moderately broad anterior fuscous band, and a fuscous posterior spot. Legs and abdomen orange-yellow. Forewings elongate, moderate, costa gently arched, termen gently rounded, oblique; 2 from three-fourths; white, markings fuscous; a narrow streak along costa from base to before third fascia; four moderately broad nearly equidistant fasciæ, first near base, narrowest in middle; second, somewhat curved inwardly from middle of costa to inner margin; third from costa at five-sixths to just before anal angle; nearly straight; fourth along termen; between the third and fourth are 2 fuscous spots on costa; an irregular suffused streak on inner margin between second and third fasciæ; cilia whitish (imperfect). Hindwings with termen rounded, sinuate beneath apex, apex faintly produced; orange-yellow, becoming broadly fuscous from apex to beyond middle of termen, finely attenuated posteriorly; cilia orange-yellow.

Apparently nearly allied to *ophioyramma*, Meyr., but immediately separated by the extra fascia (in the former species there are but three), and the yellow hindwings.

Stawell, Victoria; one specimen taken in November.

Œcophoridæ.

Crypsynarthra, n. g.

Head with appressed hairs. Antennæ moderate, in male with long fine ciliations, 3, shorter towards apex, without pecten, or with one or two fugitive hair scales. Palpi moderate, recurved, ascending, second joint thickened with dense scales, hardly reaching base of antennæ, terminal joint nearly as long as second, acute. Abdomen moderate. Posterior tibiæ thickened, clothed with dense hairs. Forewings elongate-oblong, termen oblique rounded, with 11 veins (normal veins 7 and 8 being coincident), 7 to costa, 2 from considerably before angle of cell, 4 and 5 somewhat approximated at base. Hindwings with termen rounded; neuration normal.

Mostly allied to *Atelosticha*, Meyr., but the long fine ciliations of antennæ and oblique termen are reliable characters.

Crypsynarthra chrysias, n. sp.

Male, 24 mm. Head, thorax, palpi, and antennæ reddish-fuscous, second joint of palpi somewhat whitish internally and reddish externally. Abdomen ochreous. Legs fuscous, posterior tibiæ clothed with yellow hairs, anterior and middle pair irregularly banded with whitish. Forewings elongate, moderate, costa gently arched, apex round pointed, termen obliquely rounded; reddish-fuscous, minutely irrorated with blackish; a suffused blackish mark on costa before middle, continued irregularly and obliquely to inner margin, but not reaching it; a small blackish spot at end of cell; cilia blackish. Hindwings with termen rounded; orange-yellow; cilia as in forewings. Forewings beneath yellowish-orange, costal edge dark fuscous.

Recalls species of *Heliocausta*.

Duaringa, Queensland; one specimen in December.

Hoplitica pseudota, n. sp.

Male, 22 mm. Head, palpi, and thorax fleshy-fuscous, palpi beneath whitish, somewhat fuscous on sides. Antennæ fuscous, obscurely annulated with whitish, ciliations (2). Abdomen greyish-ochreous, anterior legs dark fuscous, middle and posterior pair silvery white, tibiæ and tarsi fuscous tinged above. Forewings elongate, rather broad, costa gently arched, termen obliquely rounded; 7 to apex; dull fleshy-ochreous; costal edge obscurely whitish from base to three-fourths; markings dull purplish; some scales around cell and along fold, hardly forming definite markings; two spots in cell, one in middle and one at posterior extremity; a suffused spot beyond middle of inner margin; an outward curved line of

obscure scales from beneath costa to inner margin at anal angle; cilia ochreous, flesh colored at base. Hindwings greyish-ochreous, fuscous tinged around apex; cilia ochreous-fuscous, with an ochreous basal line.

Allied to *carnea*, Z., to which it is very similar in appearance, but the absence of dots along termen, white legs, and longer antennal ciliations are distinctive.

Duaringa, Queensland; one specimen in December.

TRACHYNTIS ARGOCENTRA, n. sp.

Male and female, 22-25 mm. Head and palpi fuscous-whitish, second joint of palpi dark fuscous on basal half, especially internally. Thorax and antennæ fuscous. Abdomen greyish, faintly suffused with ferruginous. Legs fuscous, posterior pair greyish. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; fuscous, sparsely mixed with greyish; an elongate streak of dull whitish in cell, sometimes absent, with spot of fuscous at extremities; a row of more or less connected fuscous spots along termen and apical fourth of costa; cilia fuscous. Hindwings greyish-fuscous; cilia greyish-fuscous, faintly ochreous tinged at base.

Broken Hill, New South Wales; three specimens in April.

GOMPHOSCOPA, n. g.

Head rather loosely haired. Antennæ in male bidentate, especially on terminal half, ciliations (1), basal joint short, without pecten. Labial palpi extremely long, second joint considerably exceeding base of antennæ, clothed with appressed scales, somewhat loose beneath, terminal joint slender, one-half of second recurved. Forewings elongate; 7 and 8 stalked, 7 to apex, 2 from before angle of cell, 3 from angle, 1 furcate at base. Hindwings over 1, elongate-ovate; cilia one-third; 3 and 4 connate, 5 widely remote from 4, nearer to 6.

Not very near any other genus known to me. The absence of pecten, extremely long palpi, termination of vein 7 in apex, and elongate markings would appear to have some relationship to *Œnochroa*, Meyr., yet the affinity is not clear.

The genus is formed for the reception of *Pachycera catoryctopsis*, Lower (Trans. Roy. Soc. S.A., 184 (1893). The genus was not defined at the time of writing, and as the name, *Pachycera*, is probably preoccupied, I adopt the above in place of it.

LINOSTICHA EUADELPHA, n. sp.

Male, 14 mm. Head, palpi, and antennæ reddish-fuscous; second joint of palpi rather thinly scaled. Thorax dark fuscous, patagia reddish-fuscous. Abdomen greyish. Legs fus-

cous, posterior pair greyish-ochreous, middle and posterior tarsi suffusedly ringed with whitish. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; reddish-ochreous, finely irrorated with dark fuscous scales; a black spot, usually double, at one-third from base in middle; a similar spot at end of cell, slightly oblique; a strongly curved transverse line of fine blackish scales from five-sixths of costa to anal angle, indented beneath costa; a suffused blackish line of scales along termen; cilia ochreous-reddish, mixed with a few blackish scales. Hindwings light fuscous; cilia greyish-ochreous, reddish tinged at base.

Closely allied to *cremnodisema*, Lower, but separable by the narrower wings, more slender palpi and transverse line before termen. These characters are very constant.

Brokn Hill, New South Wales; several specimens in June.

Cyclogona, n. g.

Head with appressed scales. Antennæ serrate, in male moderate, evenly ciliated (1½), basal joint moderate without pecten. Palpi moderate, second joint reaching base of antennæ, thickened with appressed scales, slightly rough beneath, terminal joint almost as long as second, slender, recurved. Thorax smooth. Forewings elongate, moderate, apex rounded, termen obliquely rounded. Hindwings elongate-ovate, nearly one, cilia one-half. (Posterior tibiæ broken.) Forewings with 7 and 8 stalked, 7 to apex, 2 and 3 on a curved stalk from before angle of cell. Hindwings with 3 and 4 slightly remote at base.

Intermediate in character between *Eulechria*, Meyr., and *Phloeopola*, Meyr., but in my judgment mostly allied to the former. It, however, differs from both the above genera by the stalking of veins 2 and 3 of forewings, a character shared only by *Guestia*, Meyr., and the allied genera, in which, however, vein 7 terminates on costa. The absence of basal pecten of antennæ is similar to *Phloeopola*, Meyr.

Cyclogona orthoptila, n. sp.

Male, 25 mm. Head and palpi white, second joint of palpi dark fuscous on basal half externally. Thorax, legs, and antennæ fuscous-whitish, patagia ochreous-fuscous. Abdomen greyish. Forewings elongate, moderate, costa gently arched, termen very obliquely rounded; white, with dark fuscous markings; a short, narrow, elongate spot beneath costa at base; a moderate spot above middle before one-third, a second just below and before, a third in middle of cell, a fourth at posterior extremity of cell, a fifth on costa just above fourth, the last two more or less connected by an ochreous shade; an outward

curved series of elongate spots from costa at four-fifths to anal angle, strongly indented beneath costa; cilia ochreous-whitish, more of less barred with ochreous-fuscous. Hindwings grey, cilia greyish-white.

Melbourne, Victoria; one specimen in December.

NEPHOGENES CENTROTHERMA, n. sp.

Male, 18 mm. Head and palpi light fleshy-red, palpi darker beneath. Antennæ and thorax dark fuscous, thorax with a moderate fleshy-red posterior spot. Abdomen and legs greyish-ochreous, anterior and middle pair fuscous beneath. Forewings elongate, moderate, costa hardly arched, termen obliquely rounded; dark fuscous; markings fleshy-red; a moderate spot at base of costa; a short elongate streak along inner margin at base; a moderate spot at one-third from base in middle, a second, similar before two-thirds, in middle, both edged with a few prominent black scales; an interrupted narrow streak along fold anteriorly, somewhat obscured; cilia greyish, mixed with blackish and fuscous scales, especially towards base. Hindwings fuscous; cilia as in forewings.

Somewhat allied to *pyrocentra*, Lower, but differs from its smaller size, different colored head, palpi and forewings. *pyrocentra* varies considerably; the type specimen represented an extreme form, as most of the specimens have fleshy-red forewings, not dark fuscous, and very few markings. The description of that species, therefore, requires broadening.

NEPHOGENY PERIGYPSA, n. sp.

Male, 20 mm. Head, palpi, and thorax snow-white. Antennæ and legs fuscous, base of antennæ whitish, posterior legs greyish-ochreous. Forewings elongate, moderate, costa faintly arched, termen very obliquely rounded; white; costa narrowly fuscous from base to one-third; a moderate, suffused light fuscous streak from middle of base to costa at two-thirds, ground color above snow-white; a similar streak along fold from base to two-third, somewhat spot-like at posterior extremity and confluent with first streak on base third; a well defined oblique ochreous-fuscous streak before termen, from beneath apex to before anal angle; cilia white, mixed with fuscous scales in middle. Hindwings and cilia very pale ochreous.

Closely allied to *olympias*, Lower, but separable by the different ground color of forewings and white head; it approaches *melanthes*, Lower, also, but in addition to the characters given above it may be distinguished from that species by the very pale hindwings and markings of forewings.

Broken Hill, New South Wales; two specimens in October.

NEPHOGENES PETRINODES, n. sp.

Male, 34 mm. Head, palpi, antennæ, and thorax grey. Palpi grey-whitish. Legs and abdomen greyish-fuscous. Forewings elongate, moderate, somewhat dilated posteriorly, costa gently arched, termen obliquely rounded; grey-whitish; a fuscous spot at base of inner margin; a fuscous spot in disc at one-third from base, a second just below and slightly beyond, a third, double at extremity of cell, and a fourth on upper margin of cell midway between first and third; a curved suffused fuscous streak, from costa before apex to anal angle, indented beneath costa; a row of black dots along termen; cilia grey. Hindwings greyish-fuscous, cilia grey-whitish, with 2 faint fuscous lines.

Nearest *atrisignis*, Lower, but immediately separated by the color of forewings and paucity and clearness of markings.

Broken Hill, New South Wales; one specimen in June.

NEPHOGENES XIPHOLEUCA, n. sp.

Male and female, 18-22 mm. Head, thorax, palpi, and antennæ white, thorax and patagia slightly infuscated, second joint of palpi beneath light fuscous, apex white, antennæ obscurely spotted with fuscous. Legs whitish, somewhat infuscated. Abdomen greyish-ochreous, segmental margins whitish. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; light ochreous-fuscous; a narrow white streak along costa, from base to three-fourths, attenuated at extremities; all veins neatly outlined with white; ground color between veins towards termen darker; a small fuscous spot in middle at one-third from base, a second immediately below, and a third at end of cell, these spots are generally obsolete; a few fuscous scales along termen; cilia greyish-ochreous. Hindwings elongate-ovate; light fuscous; cilia as in forewings.

Not very near any other; the neatness and clearness of markings is particularly noticeable.

Broken Hill, New South Wales; six specimens in April; also from Birchip, Victoria.

HETEROBATHRA, n. g.

Head with appressed scales. Antennæ without pecten (?), ciliations of male (?). Palpi very long, recurved, second joint very long, considerably exceeding base of antennæ, densely clothed with appressed scales, especially at apex, terminal joint slender, acute, about one-fourth of second. Abdomen moderate. Posterior tibiæ clothed with long fine hairs. Forewings elongate, moderate, termen very obliquely rounded, 7 and 8 stalked, 7 to immediately above apex, 2 and 3 strongly

curved downwards, 2 from before angle of cell. Hindwings over 1, elongate-ovate, termen rounded, cilia one-third.

Somewhat allied to *Nephogenes*, Meyr., but the curious palpi, absence of pecten (?), and termination of vein of above apex are distinctive characters.

Heterobathra xiphosema, n. sp.

Female, 22 mm. Head, palpi, and thorax cinereous grey. Abdomen greyish. Legs cinereous-fuscous, posterior pair whitish. Forewings elongate, moderate, costa gently arched, termen very obliquely rounded; ashy-grey-whitish; a slightly curved moderate black longitudinal streak above middle, from base of costa to just above apex of wing, thickest on basal third; a black spot at one-third from base; a second, similar, at end of cell, both touching longitudinal streak; cilia grey-whitish. Hindwings with termen rounded; grey-whitish; cilia grey-whitish.

The longitudinal black streak is very conspicuous.

A similar color and marking occurs in *Scoparia mesogramma*, Lower, one of the *Pyralidina*.

Broken Hill, New South Wales; two specimens in August.

Heterobathra bimacula, n. sp.

Female, 12 mm. Head, palpi, thorax, and antennæ dark fuscous, second joint of palpi sprinkled with white beneath. Legs fuscous, sprinkled with whitish, anterior coxæ white. Abdomen greyish-ochreous, segmental margins silvery-grey. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; dark fuscous, mixed with blackish; a distinct black dot encircled with white in middle of disc before middle; a second, similar, below and slightly beyond; an obscure Y-shaped blackish mark from base, just reaching first encircling ring; veins towards termen more or less outlined with black; a well-defined row of blackish dots along termen, continued to anal angle; cilia grey-whitish. Hindwings with termen rounded; dull fuscous; cilia greyish-fuscous.

Broken Hill, New South Wales; two specimens in August.

Heterobathra (?) semnostola, n. sp.

Male, 18 mm. Head, palpi, thorax, and antennæ cinereous-grey, palpi imperfect, second joint whitish beneath, antennæ with moderate pecten, ciliations 1. Legs fuscous, posterior pair greyish. Abdomen ochreous-grey, strongly margined on posterior two-thirds with fuscous. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; ashy-grey-fuscous, lighter on dorsal half; a moderately thick black

longitudinal median streak, from near base to apex, attenuated posteriorly and nearly connected with costa at base by a narrow fuscous shade; streak edged below in middle by a fine white line, which becomes dot-like at posterior extremity; a fine short black line along fold towards base; a small black spot below commencement of white streak; a row of black elongate spots along termen; cilia cinereous-grey, becoming blackish at base and on streak. Hindwings elongate-ovate; termen rounded; light fuscous; cilia greyish fuscous, becoming greyish-ochreous at base.

This species, which resembles *xiphosema* very closely, is doubtfully referable to this genus. The palpi are unfortunately broken, with the exception of the second joint, which agrees in structure with the genus, but the well-developed pecten of the antennæ is discordant, as in both the previous species examined it is absent, although the material at my command is scanty, so that I cannot insist on the point. Should it ultimately prove to be correctly located, then the characters of the genus will have to be altered so as to read: Antennæ with moderate pecten, basal joint moderate, ciliations (1). The present species differs chiefly from *xiphosema* by the narrower forewings, elongate dots along termen and fuscous hindwings.

Broken Hill, New South Wales; one specimen in August.

Psorosticha, n. g.

Head with appressed scales. Thorax strongly crested posteriorly. Antennæ dentate, shortly ciliated, with pecten. Palpi moderate, recurved, second joint hardly exceeding base of antennæ, densely and roughly clothed with appressed scales, terminal joint shorter than second, thickened with rough scales at two-thirds, apex acute. Abdomen rather broad. Posterior tibiæ clothed with long hairs. Forewings elongate, moderate, termen obliquely bowed, surface with tufts of scales; 2 and 3 stalked, 7 and 8 stalked, 7 to just above apex. Hindwings elongate-ovate, 3 and 4 from a point, 5 approximated to 4 at base, 6 and 7 parallel, cilia over one-third.

Not very near any other Australian genus known to me. Its nearest ally appears to be *Trachypepla*, Meyr., but the gap is rather considerable on account of the stalking of veins 2 and 3 of forewings and short antennal ciliations. In structure it more nearly approaches the European genus *Exaeretia*, *Stt.*, differing principally by the termination of vein 7 on costa, and raised scales on forewings. The species here described has the facies of a *Gelechia*.

a basal fascia, from one-third costa to one-third inner margin; a similar fascia from costa at three-fourths to anal angle, with a rounded projection on each side in middle, and leaving a spot of ground color on fasciæ between; a moderate line along termen; cilia yellow, becoming grey on lower half.

In the neighborhood of *personata*, Meyr.

Derby, Western Australia; one specimen in October.

ACOMPSIA EPILEUCA, n. sp.

Female, 16 mm. Head, palpi, antennæ, and thorax fuscous, second joint of palpi with whitish subapical band, antennæ with pecten, abdomen yellow. Legs ochreous, anterior and middle tibiæ and tarsi banded with fuscous. Forewings elongate, moderate, costa hardly arched, termen oblique, hardly rounded, 7 and 8 stalked, 7 to costa, 2 and 3 separate; fuscous, suffusedly mixed with whitish, especially along costa and posterior half of wing; a dark fuscous spot on costa at one-third, a second, larger, on middle of costa; a longitudinal series of 3 ovate, blackish white edged spots in middle of wing; 3 suffused blackish costal spots, between three-fourths and apex; a small blackish patch on termen above anal angle; cilia greyish, with a row of blackish spots at base, which are continued right around apex to costal cilia. Hindwings fuscous, becoming ochreous-tinged at base; 3 and 4 connate, 5 very closely approximated to 4 at base; cilia light fuscous, ochreous tinged at base. The neuration of hindwings is curious.

Duaringa, Queensland; one specimen in January.

ŒCOPHORA IODES, n. sp.

Female, 20 mm. Head, palpi, thorax, and antennæ deep fuscous, somewhat purplish tinged, second joint of palpi with a blackish subapical ring, apex grey-whitish, antennæ without pecten. Anterior and middle legs fuscous, tarsi obscurely banded with white, posterior pair grey. Abdomen grey-whitish. Forewings elongate, moderate, costa moderately arched, termen very obliquely rounded; 2 and 3 separate; dull purplish-fuscous; an irregular suffused black streak in middle of wing from base to posterior extremity of cell; a suffused blackish spot on inner margin near base; a row of blackish dots along termen, continued around apex to costa, where they become more elongate; cilia fuscous-purplish. Hindwings with 3 and 4 connate; grey, faintly fuscous tinged at apex; cilia grey.

Not very near any other known to me, but somewhat like *Guestia uniformis*, Meyr., but the separation of veins 2 and 3

of forewings and absence of pecten are reliable points of distinction. The genus *Œcophora*, Latr., as now restricted by Mr. Meyrick in his "Handbook of British Lepidoptera," possesses the characters of this species, *i.e.*, absence of antennal pecten, vein 7 to costa, 2 and 3 separate. Hindwings with 3 and connate or stalked.

Blackwood and Parkside, South Australia; two specimens in August.

Guestia actinipha, n. sp.

Female, 22 mm. Head, palpi, thorax, and antennæ whitish, faintly fuscous tinged, second joint of palpi beneath light fuscous, except apex, antennæ with moderate pecten. Abdomen grey-whitish. Legs white, posterior pair ochreous tinged. Forewings elongate, moderate, costa moderately arched, termen obliquely rounded; light cinerous-grey; costal edge narrowly whitish from one-third to apex; a moderately broad longitudinal white streak lying in middle of cell; cell outlined more or less with fuscous on lower edge, and continued to posterior extremity, where it is spot-like and more sharply defined; a suffused fuscous spot in disc above middle at one-third; a similar but more suffused spot just below and beyond, almost resting on, and indicating commencement of line along cell; a somewhat suffused elongate whitish streak above middle, between posterior extremity of cell and termen; a suffused fuscous line along termen; cilia grey-whitish. Hindwings grey; cilia light ochreous-grey.

The white longitudinal streak and different ground color easily separate this from the other described species.

Broken Hill, New South Wales; one specimen in May.

Guestia peladelpha, Lower.

I have a specimen of this insect, taken at Roeburne, Western Australia, in which vein 6 of the forewings is long-stalked, in addition to the usual neuration. It is a curious deformity, occurring in one wing only.

Pauronota, n. g.

Head moderately smooth. Antennæ in male moderately ciliated (1), basal joint moderate, with pecten. Labial palpi short, recurved, second joint not reaching base of antennæ, with appressed scales, somewhat loose beneath, terminal one-half of second, acute. Thorax smooth. Posterior tibiæ clothed with long hairs above. Forewings with vein 1 furcate, 7 and 8 stalked, 7 to costa, 2 and 3 rising on a curved stalk out of 4 near origin. Hindwings ovate-lanceolate, cilia 1; 3 and 4 connate, 6 and 7 parallel.

Allied to *Guestia*, Meyr., but differs by the very short palpi, shape of hindwings and longer cilia.

PAURONOTA THERMALOMA, n. sp.

Male, 18 mm. Head reddish-fuscous. Palpi, antennæ, and thorax fuscous, patagia reddish-fuscous. Legs fuscous, posterior pair grey-whitish, all tibiæ and tarsi obscurely ringed with whitish. Abdomen greyish-ochreous, anal tuft ochreous. Forewings elongate, moderate, costa hardly arched, apex somewhat pointed, termen very obliquely rounded; fuscous; all veins more or less outlined with darker fuscous; a small dark fuscous line on inner margin near base; a suffused line of dark fuscous scales along termen; cilia fuscous, becoming distinctly light reddish on basal half, and with a few blackish scales at base. Hindwings grey; cilia grey, ochreous tinged on basal half.

Broken Hill, New South Wales; one specimen in July.

MACROBATHRA DROSERA, n. sp.

Male, 16 mm. Head and palpi greyish-fuscous, dusted with whitish. Antennæ and legs dark fuscous. Abdomen fuscous, segmental margins silvery-grey. Forewings elongate-lanceolate; blackish; markings dull whitish, finely irrorated with fuscous; 3 equidistant, somewhat flattened triangular spots at one-sixth, before middle and before apex, the latter one almost reaching dorsal streak; a moderately broad dorsal streak, from base to anal angle, broadest on basal half, and with a slight sinuation on upper edge beyond middle; cilia greyish-fuscous, mixed with whitish and blackish scales at base. Hindwings fuscous; cilia greyish-ochreous.

Not very near any other; easily recognised by the markings not being white or yellow, which colors are predominant in this group.

Broken Hill, New South Wales; one specimen in October.

MIMODOXA, n. g.

Head smooth. Antennæ in male slender, moderately and evenly ciliated, basal joint elongate, without pecten. Palpi moderately long, second joint not nearly reaching base of antennæ, with appressed scales, moderately smooth beneath, terminal joint as long as second, slender recurved. Thorax smooth. Forewings elongate-lanceolate. Hindwings as broad as forewings, broadly-lanceolate; cilia one and a half. Abdomen somewhat flattened. Posterior tibiæ clothed with long hairs above. Forewings with 7 and 8 stalked, 2 from considerably before angle of cell, 3 from angle,

lower fork of vein 1 hardly obsoete towards base. Hindwings with 3 and 4 connate, 5 absent, coincident with 4.

Allied to *Macrobathra*, Meyr., but differs by neuration of hindwings. The absence of vein 5 is unusual in the *Œcophoridæ;* but Mr. Meyrick, to whom a specimen was submitted, placed it in this family.

MIMODOXA DRYINA, n. sp.

Male, 9-10 mm. Head, palpi, and thorax fuscous-whitish, second joint palpi internally blackish, and with an obscure whitish apical ring. Antennæ fuscous, irregularly annulated with white, basal joint black, with an obscure whitish ring at apex. Abdomen greyish, strongly margined with fuscous. Legs whitish, irregularly banded with fuscous, posterior pair greyish-ochreous. Forewings elongate-lanceolate; fuscous-whitish; becoming darker at base; markings black; a narrow strongly oblique fascia from costa near base to inner margin at one-sixth; a second similar fascia, more obscure, from one-third of costa to inner margin in middle, hardly reaching inner margin; a third, thicker and irregular from five-sixths costa to anal angle, broadest on costa; a more or less well-defined narrow longitudinal median streak from base to apex, suffused at apex; cilia dark fuscous, mixed with whitish. Hindwings lanceolate, thinly scaled; pale grey; fuscous towards apex; cilia ochreous-grey.

Broken Hill, New South Wales; three specimens in October.

EUCRYPTOGONA, n. g.

Head somewhat rough haired. Antennæ serrate, with tufts of long ciliations at joints, about 5, without pecten, or with one or two fugitive hair scales. Palpi porrect, terminal joint concealed, second dilated towards apex, clothed with long rough hairs above and beneath. Posterior tibiæ with long fine hairs. Forewings elongate, moderate, termen oblique; all veins separate, secondary cell distinct, 1 furcate at base, 2 from before angle, 6 and 7 remote at base, 7 to termen. Hindwings as broad as forewings, termen obliquely round; 3 and 4 widely remote at base, 5 and 6 parallel to 4, 6 to termen.

A very singular genus, which, I think, should be referred to the *Plutellidæ*, as the separation of all veins when present is a character which does not occur in the *Œcophoriaœ*. The long ciliations of antennæ and haired tibiæ of hindlegs are characters which are discordant in the former family, yet the curious palpi would appear to indicate some relationship to the latter family, especially in the genus *Pleurota*. Hb.

EUCRYPTOGONA TRICHOBATHRA, n. sp.

Male, 20 mm. Head, palpi, and thorax reddish-fuscous, thorax with 2 reddish porrected tufts of hair on anterior edge. Antennæ fuscous; ciliations nearly 5. Legs fuscous, posterior pair ochreous-grey, tibiæ clothed with long ochreous hairs, all tarsi ringed with ochreous. Abdomen fuscous. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; greyish-fuscous, strongly mixed with ferruginous, reddish, and black scales; markings blackish, obscure; a suffused streak beneath costa, from base to middle; a streak on fold from base to cell; a spot at end of cell; a mark in middle of cell; a suffused spot on inner margin near base; an interrupted streak along termen, edged posteriorly by fuscous-reddish; cilia greyish, mixed with blackish scales. Hindwings elongate-ovate, fuscous; cilia greyish, becoming dark fuscous at base.

Broken Hill, New South Wales; three specimens in May.

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

XXIX.

[Read October 1, 1901.]

CARABIDÆ.

GIGADEMA.

It is extremely difficult to identify the species of this genus that have been described in the section that have the disc of the pronotum smooth or at any rate non-punctulate. The difficulty arises chiefly from the insufficiency of the descriptions,—more particularly their reliance upon prothoracic characters (which vary sexually as well as specifically) in most cases without note of the sex of the specimen referred to. Signor Gestro furnished some valuable notes and numerous figures relating to the species of De Castelnau's collection but I am afraid his figures are not reliable (Ann. Mus. Gen., 1875). His figure of the prothorax of *G. longipenne*, Germ. (sex not specified, but it is evidently the female), makes that segment scarcely wider than long (as seven to six), but the width of the prothorax in *longipenne* (female) is as seven to four and a quarter. I am quite confident as to my identification of this species as I have examples from Germar's locality, and I have no doubt either but that Gestro's notes refer to the true *longipenne*,—the fault is in the drawing of the figure. Ten species appertaining to this section of *Gigadema* have been described (disregarding *noctis*, Newm., which seems to be a mere name). Of these ten I myself described three and *longipenne*, Germ., is well known to me. *Bostocki*, Cast. (from W.A.), I have identified with tolerable certainty by the aid of Dr. Gestro's notes. The remaining five are from Eastern Australia (Queensland and N.S. Wales). I have before me two species from that region which, however, I am not able to identify with certainty, and also a species from Victoria which is not unlikely to be one of those described from N.S. Wales. *G. atrum*, Macl., is not before me; it is a very isolated species by the form of its palpi as well as by its sculpture and seems from the description unlikely to be a true *Gigadema*. One of my three species mentioned above (from N. Queensland) is almost certainly *grande*, Macl. (female,

the type appears from the description to have been a male, but my specimen agrees with Gestro's figure of the female); the other two are not unlikely to be two of *intermedia*, Gestro, *titanum*, Thoms., and *politulum*, Macl., but I cannot identify them confidently. I have also before me two species from Central and one from Western Australia which are all certainly undescribed, and of which I furnish descriptions below. I also furnish, below, a tabulation showing the prominent characters of all the species of this section of the genus (except *intermedium*, *titanum*, and *politulum*, which I am quite confident are not identical with any of the species characterised in the tabulation, but which I am not able to tabulate from the descriptions).

In this genus the form of the ligula is very diverse, but appears to be constant in individuals of the same species; at any rate it is constant in specimens of *G. longipenne*, Germ.,—the only *Gigadema* of which I have been able to examine a fairly long series,—and also in such few specimens as I have seen of other species. The form and proportions of the prothorax also furnish reliable specific characters so long as the fact is allowed for that in nearly (if not quite) all the species the *front outline* of that segment presents *sexual* characters. Further valuable assistance in the identification of species may be found in the puncturation of the elytra, which (so far as I can judge) is but little affected by sex. The sexes in this genus are not very readily determined by external characters; I do not find any constant sexual character on the ventral segments, and the anterior tarsi are scarcely dilated in the males; in some specimens however the front tarsi bear some sucker-like papillæ on their under surface, and I have assumed this to be a male character.

G. dux, sp. nov. Mas. Robustum; nigrum; capite inæquali, sparsim irregulariter sat fortiter punctulato; ligula pernitida puncturis paucis impressa, in parte mediana depressa, ad latera elevata (antice obtuse, postice sat anguste); prothorace quam longiori ut 10 ad 6 latiori, fere ut *G. longipenne*, Germ. maris conformato (*i.e.* laterum arcu, margine antico, et angulis similibus) sed lateribus ad basin magis parallelis (his in parte dimidia postica obtuse crenulatis), disco toto fortiter crebre transversim strigato; elytris striatis, interstitiis sat planis (7° nullo modo cariniformi) creberrime nec seriatim rugulosis (sed apicem versus interstitiorum externorum punctures nonnihil biseriatim impressæ apparent). Long., 17 l.; lat., 5½ l.

A very large and deep black species. The non-seriate sculpture of its elytral interstices (except in the apical portion near the lateral margins) and the very strong close transverse wrinkling

of the disc of its pronotum at once separate it from all its described congeners.

W. Australia; sent to me by Mr. Jung.

G. longius, sp. nov. Fem. Minus robustum; piceum; capite minus inæquali sat crebre subfortiter punctulato, pone oculos haud tumido; ligula in parte mediana depressa sat opace coriacea et sat crebre punctulata, ad latera elevata (antice obtuse, postice sat anguste) obsolete sat crebre punctulata, partibus elevatis quoque grosse seriatim punctulatis; prothorace quam longiori ut 10 ad 7 latiori, fere ut *G. longipennis*, Germ. maris conformato (sed marginis antici parte mediana paullo magis prominenti), lateribus totis crebre acute crenulatis, disco leviter transversim rugato (partibus ceteris sat grosse,—quam *G. longipennis*, Germ., multo magis fortiter,—punctulatis); elytris striatis, interstitiis subplanis (7° leviter carinato) biseriatim subtilius (4°, 6°, 8°, 9° que vix seriatim, quam cetera magis crebre) punctulatis. Long., 18 l.; lat., 6 l.

Not unlike *G. longipennis*, Germ., but very much larger, the ligula totally different, the sides of the head not tumid behind the eyes, the sides of the prothorax strongly crenulate, the puncturation of the head and pronotum much stronger, the interstices of the elytra flatter, and their puncturation though scarcely finer decidedly closer,—especially on the fourth, sixth, eighth, and ninth interstices.

Central Australia (McDonnell Ranges).

G. longicolle, sp. nov. Fem. Minus robustum; piceum; capite minus inæquali sat crebre subfortiter punctulato, pone oculos vix tumido; ligula fere ut præcedentis (*G. longioris*), sed in parte mediana minus crebre punctulata; prothorace quam longiori ut 10 ad 7¾ latiori, postice sat fortiter angustato, sat fortiter subcrebre punctulato (disco lævi excepto), lateribus sat fortiter arcuatis minus fortiter sinuatis in parte postica dimidia leviter crenulatis, margine antico in medio modice prominenti, angulis anticis rotundatis posticis leviter obtusis; elytris striatis, interstitiis sat planis (7° manifeste carinato excepto) regulariter sat fortiter biseriatim punctulatis. Long., 17 l.; lat., 6 l.

The prothorax of this species is notably less strongly transverse than that of any other *Gigadema* known to me and its sides are less strongly sinuate in approaching the base. The punctures of the elytral interstices are as strong as in the species which I take to be *G. Bostocki*, Cast., but they are placed more regularly in rows and considerably more closely than in that species.

Central Australia (Oodnadatta).

TABULATION.

A. Disc of pronotum smooth or transversely strigate (not punctured).
  B Ligula strongly convex ... ... *longipennis*, Germ.
  BB. Ligula not of uniformly convex form.
    C. Ligula extremely nitid and punctureless, except having a few distant punctures ... *rugaticolle*, Blackb.
    CC. Ligula not like that of *rugaticolle*.
      D. Seventh interstice of elytra not carinate.
        E. Sides of head strongly tumid behind the eyes ... ... *eremita*, Blackb.
        EE. Sides of head not tumid behind the eyes ... ... *dux*, Blackb.
      DD. Seventh interstice of elytra carinate,—at least near the base.
        E. The interstices become near apex convex and very closely punctured *grande*, Macl. (?).
        EE. The interstices not as in *grande (?)*.
          F. More than two rows of punctures on fourth and sixth interstices .. *longius*, Blackb.
          FF. Interstices four and six with only two rows of punctures.
            G. Prothorax strongly transverse.
              H. Puncturation of interstices normal (about as in *longipennis*) . *mandibularis*, Blackb.
              HH. Puncturation of interstices much more sparse and strong *Bostocki*, Cast. (?).
            GG. Prothorax notably less strongly transverse... ... ... *longicolle*, Blackb.
AA. Disc of pronotum closely and rugulosely punctured ... ... *sulcatum*, Macl., and others forming a distinct section of the genus.

N.B.—The following described species are omitted from the above tabulation owing to uncertainty in my identification of them, viz., *G. intermedium*, Gestro, *politulum*, Macl., and *titanum*, Thoms.

XANTHOPHŒA.

X. concinna, sp. nov. Elongata; sat nitida; rufo-testacea, elytris pallidioribus singulis vittis binis nigris (altera suturali, altera submarginali) integris ornatis; oculis modicis, crebre minus leviter granulatis; prothorace quam longiori ut $2\frac{1}{3}$ ad 2 latiori, supra transversim subfortiter strigato et leviter punctulato, parte marginali late deplanata et leviter recurva, lateribus leviter arcuatis postice modice sinuatis, angulis posticis acutis sat fortiter extrorsum directis; elytris striatis, interstitiis sat planis minus crebre punctulatis (3° postice punctura setigera unica impresso). Long., 4 l.; lat., $1\frac{2}{5}$ l.

The sutural vitta of the elytra covers the sutural and second interstices; the lateral vitta covers the sixth, seventh, and eighth interstices on each elytron all the vittæ are entire and very sharply defined.

Differs from *X. grandis*, Chaud, and *suturata*, Newm., by the much stronger and closer granulation of its eyes. From the other (except possibly several which are unknown to me but are certainly quite distinct) species having the sides of the pronotum widely dilated it is readily distinguished by (in combination) its fifth elytral interstice devoid of setigerous punctures, its third elytral interstice with only one setigerous puncture, and its elytral interstices not particularly closely punctured (much less closely than in *X. vittata*, Dej.).

N.S. Wales (Blue Mountains).

X. cylindricollis, sp. nov. Elongata, angusta (quam latior fere quater longior), sat convexa; nitida; glabra; rufa, elytrorum apice antennis pedibusque dilutioribus; capite pone oculos fortiter tumido; oculis magnis, vix manifeste granulatis; prothorace quam caput manifeste angustiori, quam latiori ut 4 ad 3 longiori, subcylindrico, postice quam antice vix latiori, fere lævi, longitudinaliter profunde canaliculato, canali integro), parte laterali minus late sulcata, lateribus ante medium leviter arcuatis pone medium leviter sinuatis, angulis posticis minus acutis leviter extrorsum directis; elytris profunde striatis, striis crenulatis, interstitiis convexis subtiliter sparsissime punctulatis (3° puncturas setigeras 3 ferenti). Long., 3 l.; lat., $\frac{4}{5}$ l. (vix).

It is with some hesitation that I refer this species to *Xanthophœa*. It certainly does not look congeneric with *X. grandis*, *vittata*, and their allies. But it is much more like (in respect of facies) the species that Chaudoir placed in *Xanthophœa* under the name *ferruginea*, with which it might well be congeneric. However, as Mr. Sloane has recently proposed an arrangement of the Australian genera of *Lebiides* (Pr. L.S., N.S.W., 1898) which seems to me satisfactory (at any rate provisionally) and intelligible, that for me settles the matter, and I think it well for workers on Australian *Carabidæ* to follow as much as possible his definitions of genera and so leave him a free hand to improve his work himself if in some instances he should find that his generic definitions are of too wide a character. Mr. Sloane's essential characters for *Xanthophœa* are "4th joint of tarsi bilobed, antennæ inserted considerably in front of the eyes, tarsi setose on the upper surface," all of which are characters of the present species. He includes in *Xanthophœa* all the Australian species that have hitherto been referred to *Demetrias*.

The nearest ally known to me of this species is the insect discussed below under the name *X. (Demetrias) longicollis*, Macl., from which it differs *inter alia* by its narrower and more convex form, longer prothorax, and especially the well-marked dilatation (behind the eyes) of the sides of its head. The last-mentioned

character *inter alia* also distinguishes this species from *X. (Demetrias) tweedensis*, Blackb., and *X. (Cymindis) rufescens*, Macl., to both of which it is allied.

N. Queensland; sent to me by Mr. Koebele.

X. (Cymindis) longicollis, Macl. I have received from Mr. Lea some specimens of an insect from Northern N.S Wales which the sender says are *C. longicollis*, Macl., Mr. Lea appears to have compared them with Macleay's type and therefore I suppose his determination may be accepted (Macleay's description is quite useless). The species sent by Mr. Lea is the same that I have regarded as *X. ferruginea*, Chaud., and which I still believe to be that insect; if it be so, Chaudoir's name must be dropped in favor of the name *Xanthophæa longicollis*, Macl.

X. (Demetrias) rufescens, Macl. I have examples from Cairns (Macleay's locality) of an insect which agrees well with the description of this species except in its elytral interstices (not "without punctures" but) under a strong lens showing some fine and very sparse puncturation. I have no doubt of its being *X. rufescens* but I am not satisfied that it is distinct from *X. longicollis*. Its elytral interstices are certainly less strongly convex (especially near the lateral margins) than those of *longicollis*, but I cannot find other characters to distinguish it.

TRIGONOTHOPS.

In Proc. L.S., N.S.W., 1892, pp. 65 and 66, I furnished some notes in which I drew attention to the difficulty of distinguishing *T. longiplaga*, Chaud, from *T. pacifica*, Er. Since the publication of those notes I have collected both species in the localities where the types were taken, and have found that they are certainly distinguishable by their sexual characters, but I cannot distinguish them otherwise. The male of the species which I take to be *longiplaga* has its front tarsi strongly dilated and four setigerous punctures on its apical ventral segment; the male of *pacifica* has front tarsi much less dilated, and only two setigerous punctures on its apical ventral segment. Usually the anterior pale spot reaches the front margin of the elytra in *longiplaga*; it very rarely does so in *pacifica* but there are exceptions in both species. The "vars.?" *lindensis* and *occidentalis* which I referred to *pacifica* may possibly be vars. of *longiplaga*.—or even distinct species,—as they are females, and I cannot find any character to differentiate the females. I have not seen a male of *pacifica* except from Tasmania or of *longiplaga* except from Victoria.

T. flavofasciata, Chaud. This species is distinguishable from *T. pacifica*, Er., and *longiplaga*, Chaud, by its wider prothorax and its elytral interstices considerably more distinctly punctured. The lateral dilatation of the anterior pale space on its elytra is

rarely wanting. So far as I can judge it is never present in *pacifica* or *longiplaga*. In Pr. L.S., N.S.W. (*loc. cit.*), I expressed doubt as to the validity of this species but the further examination of additional specimens has dispelled my doubts. Its male has front tarsi only feebly dilated and only two setigerous punctures on the apical ventral segment.

ECTROMA.

In Pr. L S., N.S.W., 1889, p. 710, I proposed this name for certain species allied to *Sarothrocrepis* which the Baron de Chaudoir had stated were in his opinion distinct from that genus. I regard *Dromius civica* as the type of *Ectroma* and it was on that insect that the characters distinguishing *Ectroma* from *Sarothrocrepis* were specified. I am not sure that the three other species which de Chaudoir considered congeneric with *civica* are really so, nor am I certain that I know them all (two at least of them are quite insufficiently described). If I am right in my identification of them—and I think I can hardly be mistaken in one at least (*Lebia benefica*, Newm.)—their sexual characters are slightly different (the intermediate tarsi in the male being feebly dilated) but they agree with *D. civica*, Newm, in what I regard as the essential distinction of *Ectroma* from *Sarothrocrepis*—viz., the form of the apical joint of the labial palpi, which is in *Sarothrocrepis* compressed and at the apex wide and truncate, while in *Ectroma* it is more slender and at the apex attenuate (though very narrowly truncate at the extreme apex). There are a number of Australian species in my opinion best placed at present in *Ectroma* which differ a little *inter se* in respect of structural characters and which may possibly call for the creation of several new generic names eventually. Their structural differences consist chiefly in sexual characters and in the form of the fourth joint of the tarsi. In most of them the fourth joint of the tarsi is (as in *civicum*, Newm.) bilobed on all the tarsi; in one species (described below) the fourth joint is alike on all the tarsi but is not actually bilobed (it is dilated and the claw joint is inserted on the upper surface near the base, but the apex viewed from beneath is not or but slightly emarginate); in two other species (described below) the fourth joint of the front and middle tarsi is bilobed while that of the hind tarsi is simple. The following are the leading characters which I regard as in combination distinguishing *Ectroma* from allied genera:—The fourth joint of at least the front and middle tarsi dilated and having the fifth joint inserted near its base (its apex not, or more or less strongly, emarginate), claws pectinate, upper surface of tarsi not setose, base of antennæ not far distant from the eyes, apical joint of labial palpi more or less slender and towards its apex attenuate, body not pubescent.

The following names appear to have been given by the earlier authors to insects that I should refer to *Ectroma*, viz.,—*Dromius tridens*, Newm., *Lebia benefica*, Newm., *L. Duponti*, Putz., and *Cymindis inquinata*, Er. I regard the first three of these as representing but one species which must stand as *Ectroma tridens*, Newm. In Proc. L.S., N.S.W., 1892, p. 67, I conjectured that *D. tridens* might be the same as *Trigonothops pacifica*, Er., with the description of which its description such as it is agrees decidedly better than it does with the description of *Lebia benefica*, Newm.; nevertheless de Chaudoir states confidently (Berl. Ent. Zeit., 1873, p. 54),—possibly on an actual inspection of the type,—that *D. tridens* is congeneric with *L. benefica*, Newm. (which he certainly would not have stated if it had been a *Trigonothops* and if he had the type before him), and moreover I have (since I wrote my note on *D. tridens*) received from Mr. A. Simson a specimen stated to be on the authority of M. Putzeys named *D. tridens* which is certainly an *Ectroma* and in my opinion conspecific with *E.* (*Lebia*) *benefica*, Newm. These two items of evidence are no doubt strong, and in deference to them it seems best to regard *Dromius tridens* (until further evidence is forthcoming) as an *Ectroma* badly described by its author and as identical with *Lebia benefica*, Newm. I cannot, however, leave the subject without adding the remarks that Newman is hardly likely to have described the same insect as a *Dromius* and as a *Lebia;* and that the facies of *Dromius* (to which Newman attributed his *tridens*) is very much more that of *Trigonothops* than of *Ectroma*, while the facies of *Lebia* is much more that of *Ectroma*.

As regards *Lebia Duponti*, Putz., de Chaudoir states (I have no doubt correctly) that it is identical with *L. benefica*, Newm. Concerning *Cymindis inquinata*, Er., de Chaudoir states that it is congeneric with *L. benefica* and the description reads like that of a possible variety of that species (which is common in Tasmania,—Erickson's locality for *inquinata*), but as I have not seen a specimen exactly agreeing with the description of *inquinata* it is better for me to consider it probably a good species.

Of subsequently described species the following seem likely to be referable to *Ectroma* though placed in different genera. It seems well to mention them here for the guidance of future describers, although their descriptions are not of a kind to indicate their generic position and I conjecture them to belong to *Ectroma* chiefly by the notes of their size and style of markings. They are *Trigonothops ornata*, Macl. (which must be very like *E. benefica*, Newm.) and *Sarothrocrepis liturata*, Macl., *notata*, Macl., *notabilis*, Macl., and *fasciata*, Macl. They are all from N.W. Australia except *fasciata* which is from Queensland.

I may add that two species described by me as of this genus (*obsoletum* and *parvicolle*) are only doubtfully referable to it, their antennæ being inserted at a greater distance from the eyes than those of typical species. I should have been disposed to place them in *Trigonothops* were it not that one of them (*obsoletum*) has the fourth joint of its tarsi not truly bifid (though appearing so when viewed from the upper side) and that in the other the position of the antennæ seems really intermediate between its position in those two genera while its facies is much more that of *Ectroma* than of *Trigonothops*. Perhaps in reality they ought to be considered as representing two new genera,—one of which may be *Eulebia* (a genus unknown to me and not recognisably diagnosed).

It is further to be noted that it is just possible I may in the following descriptions re-name some of Macleay's species mentioned above, the descriptions of which are merely brief indications of color and markings,—but as none of my species agree satisfactorily with those indications and are all from localities very distant from those quoted by Macleay I do not think identity probable.

E. elegans, sp. nov. Mas. Testaceum, prothoracis parte mediana late ferruginea, elytris macula magna communi nigro-fusca ornatis (hac reversa arborem simulanti, ad basin sicut ad striam 5^{am} utrinque extenditur dilatata, parte frondem simulanti ad striam 7^{am} utrinque et ad partem apicalem 8^{am} extensa, in parte dilatata basali utrinque macula parva subscutellari testacea notata); oculis subtiliter nullo modo obsolete (fere ut *E. beneficæ*, Newm.) granulatis; antennis mox ante oculos insertis; capite coriaceo subopaco parum convexo; prothorace quam longiori ut 2 ad 1⅓ latiori, antice quam postice manifeste angustiori, canaliculato, coriaceo, subopaco, lateribus sat fortiter rotundatis nullo modo sinuatis, latitudine majori vix ante medium sita, angulis posticis obtusis nullo modo reflexis, basi bisinuata vix lobata; elytris nitidis, striatis, interstitiis antice subconvexis postice planis; tarsorum omnium articulo 4° subtus producto ad apicem vix emarginato, supra fere ad basin concavo; articulo 5° prope 4^{i} basin inserto; unguiculis pectinatis. Long., 2¾ l.; lat., 1⅕ l.

The common dark blotch on the elytra (viewed with the head of the insect towards the observer) resembles the figure of a tree, with the basal part of the trunk greatly dilated and the upper outline of the foliage serrate.

Victoria.

E. inquinata, Er. I have before me specimens from Western and South-Western Australia which appear to me distinct from

E. benefica, Newm., though undoubtedly closely allied to it. Structurally they differ by their coriaceous subopaque head and prothorax and the evidently greater length of the basal joint (as compared with the second) of their hind tarsi. The pattern of their elytra differs by the absence of a humeral dark mark and the dark mark behind the middle not being produced forward on the suture. I should have no hesitation in describing this insect as a new species were it not for the possibility of its being a variety of *E. (Cymindis) inquinata*, Er.,—having the external discal dark mark attributed to that species confluent with the post-median blotch.

E. grave, sp. nov. Testaceum, elytris macula basali (hac in interstitio 4° sita) macula humerali et macula communi post-mediana (hac marginem lateralem attingenti, antrorsum in sutura et ad marginem lateralem late breviter producta, apicem fere attingenti) fusco-nigris ornatis; capitis forma antennarum insertione et oculorum granulis ut præcedentis (*E. elegantis*); prothorace quam longiori ut 1½ ad 1 latiori, antice parum angustato, canaliculato, ut caput subtiliter coriaceo subopaco, lateribus leviter arcuatis pone medium subsinuatis, angulis posticis obtusis (sed fere rectis) manifeste reflexis, basi media late leviter lobata, latitudine majori sat longe ante medium sita; elytris sat nitidis, striatis, interstitiis antice sat manifeste postice vix convexis; tarsorum anticorum 4 articulo 4° bilobo, posticorum hoc articulo simplici perbreve (quam articulus 3us duplo breviori); unguiculis pectinatis. Long., 2½ l.; lat., 1⅓ l. (vix).

At once separable from the preceding two species by the fourth joint of the hind tarsi being simple. The post-median common dark blotch on the elytra extends from margin to margin, occupying about the front two-thirds of the hind half of the elytra, and is feebly produced forward at its extremities and on the suture; its hind margin is not far from straight. The front and middle tarsi are feebly dilated in the male. It is just possibly identical with *Sarothrocrepis Mastersi*, Macl. (from Queensland), of which the entire description is as follows:—"Length, 3 l. This species, though much smaller, looks very like *Lebia posticalis*, Guer. It is however of rather a paler hue, and the black fascia on the elytra is larger."

Victoria and Tasmania.

E fasciata, Macl. (?). I have before me specimens which may appertain to this species. They are from Queensland, Central Australia, and North-west Australia, and therefore likely in respect of their habitat to be Macleay's insect. The description of it is as follows:—"Length, 2 l. Like the last (*Sarothrocrepis*

pallida) but much smaller, and with a broad black fascia on the hinder part of the elytra which is prolonged along the suture towards the apex." The description of *S. pallida* is a similar comparison of that species with *S. Mastersi*, and the description of *S. Mastersi* (as noted above) a similarly brief comparison with *S. posticalis*. There is not much in the above to assist identification, but I remember seeing the type of *fasciata* some years ago at Sydney and recognise the present species as at any rate considerably resembling it. The species that I therefore call "*E. fasciata*, Macl (?)" is entirely testaceous except some fuscous coloring (not always present) along the front of the pronotum and the sides of the abdomen, and on the elytra a dark subbasal spot on either side near the scutellum and a dark marking behind the middle the form of which is difficult to describe; the second interstice is dark from the middle for about two thirds of its distance thence towards the apex, the third and fourth interstices are dark from about the beginning of the apical one-third of their length to about the beginning of the apical one-fourth, the fifth interstice is dark on a still smaller space, and the sixth interstice is dark from about the middle of its length for about one-half its distance thence to the apex; the first interstice is slightly infuscate on the part corresponding to that which is dark fuscous on the second interstice. Thus the dark portions of the interstices form a kind of common fascia extending from the sixth interstice on one elytron to the same on the other elytron, which fascia is strongly trifid on its front margin and jaggedly arcuate on its hind margin. The above markings scarcely vary in the dozen specimens that are before me. The granulation of the eyes, insertion of antennæ and coriaceous subopacity of the pronotom do not seem to differ much from the same in the preceding species. The prothorax is wider than in the allied species, its width being to its length almost as one and two-thirds to one. The striation and interstices of its elytra are not noticeably different from the same in *grave*. The tarsi very closely resemble those of *grave*, with the exception that the fourth joint of the hind pair is notably longer, being quite distinctly more than one-half the length of the preceding joint. I possess besides the specimens described above two examples of an *Ectroma* from South-west Australia (Eucla) which I take to represent a variety of the same insect as I can find no difference except in the markings of the elytra which are almost exactly as in the species that I have (above) called "*E. inquinata*, Er. (?)." Of the two forms this latter (from Eucla) seems to agree more exactly than the other with Macleay's quasi-description.

It is perhaps possible that the insect described above is that

which in his paper on the *Carabidæ* of West Australia (P.L.S., N.S.W., p. 499, 1898) Mr. Sloane has called *E. beneficum*, Newm. I have not seen the true *beneficum* from West Australia.

E. fragile, sp. nov. Testaceum, elytris macula basali (hac in interstitio 4° sita) et notulis brevibus linearibus in interstitiis 2° 4° 6° que sitis sicut ut notulæ arcum interruptum communem formant (hoc ab elytrorum longitudinis medio retrorsum directo) fuscis ornatis, abdominis segmentis prope latera et apicem fusco-notatis, nonnullorum exemplorum notulis fuscis nonnullis carentibus; capitis forma antennarum insertione et oculorum granulis fere ut *E. elegantis;* prothorace quam longiori ut $1\frac{1}{2}$ ad 1 latiori, antice parum angustato, canaliculato, cum capite subtiliter coriaceo subopaco, lateribus modice arcuatis pone medium vix subsinuatis, angulis posticis obtusis quam *E. gravis* minus reflexis, basi media late leviter lobata, latitudine majori sat longe ante medium sita; elytrorum striis interstitiisque fere ut *E. gravis;* tarsis ut *E. fasciata*, Macl. (?) (ut supra descriptum est). Long., $2\frac{1}{5}$ l.; lat., $1\frac{1}{10}$ l.

This species is of somewhat fragile depressed appearance as compared with its allies. It can be readily distinguished from all the others described above except *E. fasciata*, Macl. (?) by the structure of its hind tarsi, from the last-named species by its very much less transverse prothorax as well as by its different elytral markings.

South Australia (Sleaford Bay).

The following is a tabulation showing the characters of the species known to me of *Ectroma*.

A. Head considerably longer than in the following species ... ... *parvicolle*, Blackb.
AA. Head notably shorter.
  B. None of the tarsi have the fourth joint simple.
    C. Apex of the elytra dark ... ... *civicum*, Newm.
    CC. Apex of the elytra pale.
      D. Joint 4 of the tarsi strongly dilated and at apex not emarginate ... ... *obsoletum*, Blackb.
      DD. Joint 4 of the tarsi less dilated, and at apex emarginate (in some species feebly).
        E. Sides of prothorax strongly and evenly rounded, not at all sinuate ... ... *elegans*, Blackb.
        EE. Sides of prothorax neither strongly nor evenly rounded.
          F. Pronotum nitid, not coriaceous ... { *tridens*, Newm. (?) / *beneficum*, Newm.
          FF. Pronotum subopaque, coriaceous ... *inquinata*, Er. (?)
  BB. Joint 4 of hind tarsi simple.
    C. This joint extremely short ... ... *grave*, Blackb.
    CC. This joint notably longer.
      D. Prothorax very strongly transverse ... *fasciata*, Macl. (?)
      DD. Prothorax much less transverse ... *fragile*, Blackb.

DIABATICUS.

D. collaris, sp. nov. Sat elongatus; sat nitidus; glaber; rufo-brunneus, elytris circa scutellum et latera versus infuscatis; capite parvo; prothorace quam longiori ut 6 ad 5 latiori, antice quam postice sat angustiori, longitudinaliter profunde canaliculato, lateribus late explanatis (fere ut *Xanthophœæ vittatæ*, Dej.) pone medium subsinuatis, angulis posticis bene determinatis sed fortiter (quam *D. australis*, Er., multo magis fortiter) obtusis; elytris striatis, interstitiis leviter convexis (3° bipunctato) coriaceis. Long., 4 l.; lat., 1½ l.

The insect described above seems to be certainly congeneric with *D. australis*, Er., agreeing with it in the following characters:—Head not convex between the eyes, constricted (but obliquely narrowed) and transversely impressed behind the eyes; mentum with a median tooth; tarsi glabrous on upper surface (their fourth joint not bilobed); claws serrate; elytra glabrous. In all other respects likely to be generic it agrees with *D. australis*, Er., and has the facies of that species. It is readily distinguished from *D. australis inter alia* by its narrower prothorax which is widely explanate (somewhat as in *Xanthophœa vittata*, Dej.) on the sides.

Victoria.

D. pauper, sp. nov. Minus elongatus; subnitidus; glaber; rufo-brunneus, prothoracis disco et elytris (margine excepto) piceo-brunneis; capite sat magno; prothorace quam longiori ut 4 ad 3 latiori, antice quam postice vix angustiori, longitudinaliter sat fortiter canaliculato, lateribus ut *D. collaris* explanatis pone medium subfortiter sinuatis prope angulos anticos breviter ciliatis, angulis posticis rectis; elytris fortiter striatis, interstitiis subconvexis minus latis punctulatis. Long., 3 l.; lat., 1½ l.

This species presents all the generic characters attributed (above) to *D. collaris*, nor can I find any other characters less indicative of generic agreement with *D. australis* unless the presence of a few fine short setæ fringing the front portion of the lateral edges of the prothorax can be regarded as such a one. It has stout antennæ and short stout tarsi (the fourth joint of the latter emarginate, though by no means bilobed) exactly like those of *D. australis*, Er., excepting that the tarsi of the hind legs—as is also the case with *D. collaris*—are a little less stout. It is at once distinguishable from its two described congeners by *inter alia* the narrower more convex and quite strongly punctulate interstices of its elytral striæ.

Tasmania.

PHLŒOCARABUS.

The following species is a member of this genus according to Mr. Sloane's definition of it in his remarks on the *Lebiides* in Proc. L.S., N.S.W., 1898. It has all the structural characters that I have quoted above as distinctive of *Diabaticus* with the exception that its head is abruptly (not obliquely) narrowed behind the eyes, which Mr. Sloane says is the case with species that he places in *Phlœocarabus*. It is to be noted, however, that De Chaudoir proposed a new generic name (*Notoxena*) for one of those species—in Mr. Sloane's opinion incorrectly. The fact is that the genera of the *Lebiides* (as Mr. Sloane points out, quoting Dr. Horn in confirmation) are in a very serious state of confusion; and there are not a few genera—*Phlœocarabus* included—to which it is not in my opinion wise to refer any species without specifying the characters on which the reference is founded, to enable future authors when difficulties are cleared up, to determine the proper place of such species. The following species is certainly, I think, identical generically with the insect that Mr. Sloane calls *Phlœocarabus* (*Trigonothops*, Macl.; *Notoxena*, Chaud.); *nigricollis*, Macl., from which I do not find it to differ structurally in any respect except that its head is a little shorter and its tarsi are more slender.

P. Farinæ, sp. nov. Glaber; testaceus, capite prothoraceque rufescentibus, in elytris regione scutellari, sutura (apice summo excepto) et fascia postmediana piceis, hac postice serrata; oculis leviter nec subtiliter manifeste granulatis; prothorace sat fortiter transverso, supra transversim subtiliter rugato, longitudinaliter canaliculato, ad latera late explanato, antice parum emarginato, lateribus pone medium sinuatis, angulis posticis acute rectis, basi media sat fortiter lobata; elytris coriaceis, striatis, interstitiis leviter convexis, 3° puncturis 3 instructis (punctura postica ad apicem summum posita); tarsis sat gracilibus. Long., 2—2½ l.; lat., ⅘—1 l.

The width of the post-median fascia and the size of the scutellar blotch in one of my two specimens are considerably greater than in the other. This evidence of variability renders it impossible to specify any difference between this species and *P. nigricollis*, Macl., in respect of color and markings except that the head and prothorax are bright rufo-testaceous in this species. Compared with *P. nigricollis* this species apart from color has an almost similar pronotum which however is a little less explanate laterally and has hind angles a trifle sharper; the sculpture of its elytra is scarcely different, perhaps a trifle less deep. The much smaller size, the shorter head and the consider-

ably more slender tarsi, however, furnish very satisfactory distinctions.

Central Australia (Farina, at light).

TAROMORPHA.

Mr. Sloane (*loc. cit.*) includes this among the genera unknown to him, which consequently he cannot place in his tabulation of *Lebiini*. Its place in his tabulation is beside *Coptoglossus* from which it differs by its mentum devoid of a median tooth.

SILPHOMORPHA.

S. rufoguttata, Blackb. This species—described by me Tr. R. Soc., S.A., 1893, p. 295—was wrongly referred to *Silphomorpha*, being a member of the allied genus *Adelotopus*. I carelessly overlooked the fact that its eyes are margined externally. It must be very like *A. bimaculatus*, Macl., and may be identical with it. The diagnosis of that insect is too brief (consisting of nine words) for confident identification but such as it is it fits my specimen. The diagnosis however is followed by the additional (the only additional) information, "This species is narrower than the last" (*A. apicalis*). My insect is much *less* narrow than that which I have regarded as being *A. apicalis*, Macl., and in fact is wider than any other *Adelotopus* known to me—which, no doubt, was the cause of my calling it a *Silphomorpha* without sufficient study of its characters. It is uncertain therefore whether the name *rufoguttata* can stand as representing a species distinct from *bimaculata*, Macl.

CLIVINA.

C. eyrensis, Blackb. I suspect this species cf being identical with *C denticollis*, Sloane. When (at the time I described it) I compared it with Mr. Sloane's descriptions and referred it to his "*obliquata* group," I held it to be a member of the section of that group in which the elytral striæ are not "simple," and so did not consider the question of its being *denticollis* which forms the other section In revising the nomenclature of my *Clivinæ* I have noticed the satisfactory agreement of this species with the description of *denticollis* in all respects except the puncturation of its elytral striæ, and observing that those impressions are certainly only *very feebly* punctured and bearing in mind that the distinctness of puncturation is not a very reliable character in the *Scaritides*, I deem it probable that the name *eyrensis*, Blackb., must become a synonym of *denticollis*, Sloane.

HARPALUS.

H. promtus, Er. I have already (Pr. L.S., N.S.W., 1890, p. 557) noted the occurrence of an insect agreeing well with the description of *H. promtus* in South Australia. It agrees so well

with the description that I consider nothing wanting to assure the identification except the inspection of specimens from Tasmania. Since my former note was written I have found it on the Victorian mountains. De Chaudoir referred *H. promtus* to *Bradycellus*. The species before me, however, is certainly congeneric with those which Mr. Sloane has referred to the genus *Euthenarus* (on comparison with New Zealand specimens) which was founded by Bates for some *Harpalidæ* from New Zealand allied to *Bradycellus*. The species that I have before me differs from the other two described Australian *Euthenari* by *inter alia* the sharply rectangular hind corners of its prothorax.

HAPLANER.

H. insulicola, sp. nov. Robustus; modice elongatus; nitidus; piceus, palpis pedibus antennarum basi et elytrorum lateribus postice testaceis, nonnullorum exemplorum pronoto et corpore subtus obscure rufescentibus; capite sat magno, antice utrinque impresso; prothorace sat fortiter transverso, supra lævi, subtiliter canaliculato, postice utrinque impresso, basi quam margo anticus vix latiori, lateribus modice arcuatis, latitudine majori ante medium sita, angulis anticis haud productis posticis obtusis; elytris postice ad latera haud distincte sinuatis, profunde striatis, striis externis (9ª et 8ª parte postica exceptis) et ceterarum (1ª 2ª que exceptis) parte postica obsoletis, striarum interstitiis fortiter convexis, stria basali brevi fere nullo.

Maris quam feminæ statura sat brevior est. Long., $2\frac{1}{2}$—3 l.; lat., 1—$1\frac{1}{10}$ l.

This species is evidently congeneric with *H. velox*, Cast., agreeing with it in the non-dilated tarsi of its male, the absence of defined lateral elytral striæ, and the almost non-sinuate lateral margin of the elytra. It differs from *velox inter alia* by the four inner striæ of the elytra being very much more deeply impressed and having their interstices quite strongly convex, and by the eighth elytral stria running forward into the front one-fourth of the elytra where it coalesces with the ninth stria.

Thursday Island; given to me by Captain Bourke, R.N.

H. velox, Cast. Mr. Sloane (P.L.S., N.S.W., 1898, p. 460) expresses a doubt as to the occurrence of this species near Melbourne. I have it from that locality and also from S. Australia.

N.B.—I do not know the derivation (and the consequent gender) of the name *Haplaner*. Is it a misprint for *Haplanes?* I see Mr. Sloane calls it "Harplaner" but that is not Chaudoir's name nor is it more intelligible than *Haplaner*.

NOTOPHILUS.

N. lætus, Blackb. I have specimens from tropical Queensland (sent to me by the late Mr. Cowley, of Cairns) which I am unable to separate from this South Australian species.

LECANOMERUS.

L. obscurus, Blackb. This species (described in Tr. Roy. Soc., S.A., 1887, p. 189) is a form of *Stenolophus (Harpalus) dingo*, Cast., and the name must sink into a synonym of the latter species. I may say that in my opinion this insect cannot rightly be associated with the European *Stenolophi*, from which it differs widely in the form of the fourth joint of its tarsi, &c.; it seems to require a new generic name, as it differs from *Lecanomerus* and other *Harpalid* genera of Australia in the shape of its mandibles and other characters. As, however, Mr. Sloane is at present working as an able specialist on the Australian *Carabidæ*, I shal' leave the matter for his treatment.

L. (Diaphoromerus) victoriensis, Blackb. In P.L.S., N.S.W., 1890, p. 777, I explained my reasons for calling this insect, with much hesitation, a *Diaphoromerus* Mr. Sloane has recently (*l.c.*, 1898, p. 464) traversed this reference in favor of *Lecanomerus*. I take this opportunity of saying that I concur in his remarks.

THENAROTES.

T. metallicus, Blackb. This species would be better placed in *Notophilus*.

T. minor, Blackb. I named this (Tr. R.S., S A., 1887, p. 185) as doubtfully a variety of *T. discoidalis*, Blackb. A recent examination of it however points to its being a good species as, apart from color differences, I find that the basal foveæ of the pronotum are separated from the lateral margin by a slightly convex unpunctured space, whereas in *T. discoidalis* they are continuous to the lateral margin.

T. discoidalis, Blackb. This species is very near *Trechus atriceps*, Macl., which (as I have already noted, Tr. R.S., S.A., 1895, p. 28) is a *Thenarotes*. I think it distinct, however, as the smallest specimen I have seen is notably larger than *T. atriceps*, and the sides of its prothorax are very evidently less strongly rounded.

LESTIGNATHUS.

L. minor, Blackb. This species must be removed to the closely allied genus *Hormacrus* recently (P.L.S., N.S.W., 1898, p. 488) founded by Mr. Sloane.

LACORDAIRIA.

Mr. Sloane (*loc. cit.*, *p* 487) expresses the opinion that this genus and a number of others that have hitherto been attributed to widely different groups of *Carabidæ* ought to be associated together and placed among the *Licinides*. In this I think he is right. I cannot, however, follow him in the opinion that *L. anchomenoides*, Cast., *argutoroides*, Cast., and *marginata*, Cast., ought to be attributed to the genus *Microferonia*. I

think he bases this reference on the episterna of the metasternum being in those species narrower than in *L. proxima*, Cast., which he regards as a typical *Lacordairia* (probably correctly, although I do not know *L. cychroides*, Cast., which is I presume the real type, and Mr. Sloane seems to imply that he has not seen it either). For my part I do not find the diversity in the episterna of the species mentioned above at all of a kind that would suggest generic diversity to me, and certainly the species are extremely like each other in facies. But however that may be it appears to me that the episterna of the least closely allied of them all are far less distinct *inter se* than they all are from the episterna of *Microferonia*, which moreover is very different from them all in facies. My own inclination is to leave them in *Lacordairia*, but if they are to be removed from it I think they ought to be formed into a new genus. Mr. Sloane in his tabulation of *Licinides* (*loc. cit.*, p. 188) makes two aggregates of genera having the episterna respectively "quadrate (short)" and "decidedly longer than broad." I feel no hesitation whatever in referring all the species of *Lacordairia* mentioned above to the former aggregate and no hesitation in referring *Microferonia* to the latter. I do not feel much doubt as to the correctness of my indentification of the species mentioned (I collected the specimens on the Victorian mountains—Castelnau's locality), except in the case of *L. argutoroides*, my single (supposed) example of which is much darker in color than the description indicates and which moreover certainly presents some structural differences from the other three, but not in the direction of *Microferonia*.

L. angustata, Cast. I have a specimen (taken by myself on the Blue Mountains—Castelnan's locality) of an insect which I cannot doubt is this species, as it agrees perfectly with the description. It, however, is a *Siagonyx* (having the intercoxal projection of the prosternum strongly margined behind, &c.), and is closely allied to *S. amplipennis*, Macl. (my identification of which has been confirmed by Mr. Sloane), but it differs from Macleay's species *inter alia* by its prothorax being very much narrower and its labrum so deeply bisinuate that the middle part stands out as a strong projection.

TRECHUS.

The Australian species that I attribute to *Trechus* differ considerably *inter se* in facies, none of them, moreover, bearing much resemblance to any European species known to me. Their characters of a kind likely to be generic are very uniform however excepting perhaps those of *T. baldiensis* in which the recurved elytral striole is very near the margin—practically wanting—and *T. Tasmaniæ* whose comparatively stout antennæ and

short stout palpi (which nevertheless are of the *Trechus* type) suggest a doubt whether it might not suitably receive a new generic name. Until there is reason to believe that most of the Australian *Trechides* are known it seems to me best to attribute to *Trechus* all the species presenting the following characters (and not differing from *Trechus* by any other obviously generic peculiarity), viz :—Anterior tarsi of male with the basal two joints (only) dilated ; antennæ with only the basal joint less pubescent than the other joints ; apical joint of palpi of normal length and of elongate-conic form (pointed at apex) ; frontal sulci of head arched, and continued hindward towards (or behind) the hind margin of the eyes.

The number of Australian species that have been attributed to *Trechus* is, I believe, eleven. Four of these were described by Sir W. Macleay and could not be identified from the descriptions. I have, however, seen the types, all of which are from Queensland. I have already (Proc. L.S., N.S.W., 1892, p. 97) reported that three of them belong to other genera than *Trechus* while the other (*concolor*) I could not feel confident about, the specimen being a female and material for comparison with other species not being at hand ; it did not, however, seem to me to be a *Trechus*. Of the remaining seven I have before me types or co-types of all except one—*T. nitens*, Putz. That species is probably near my *T. Tasmaniæ*, but it is evidently not identical as it is described as having all its elytral striæ distinct except the seventh and the base of the prothorax very little more than half as wide as the the front. The following table will indicate characters by which the already named species of *Trechus* may be distinguished—those attributed to *T. nitens* being founded on the description only.

A. Prothorax not narrower at base than on front margin.
  B. Elytra fully striate.
    C. Interstices of elytral striæ very strongly convex near apex ... ... *Victoriæ*, Blackb.
    CC. Interstices of elytral striæ not or but little convex.
      D. Prothorax strongly transverse ... ... *diemenensis*, Bates.
      DD. Prothorax very slightly transverse ... *subornatellus*, Blackb.
  BB. Elytra with seventh and eighth striæ not, or scarcely, traceable.
    C. The elytral striæ strongly punctulate ... *baldiensis*, Blackb.
    CC. The elytral striæ non-punctulate ... *solidior*, Blackb.
AA. Prothorax distinctly narrower at base than on front margin.
  B. Elytra fully striate ... ... *Simsoni*, Blackb.
  BB. Elytra with only the seventh stria wanting *nitens*, Putz.
  BBB. Elytra with only the three or four inner striæ distinct ... ... *Tasmaniæ*, Blackb.

T. subornatellus, sp. nov. Minus elongatus ; subovatus ; sat convexus ; sat nitidus ; piceo-niger, palpis antennarum basi

pedibus et elytrorum fascia postmediana maculari maculisque nonnullis subapicalibus testaceis; capite parvo, sulcis frontalibus profundis fortiter arcuatis; oculis minus convexis; prothorace quam longiori ut 5 ad 3½ latiori, antice quam postice angustiori, longitudinaliter sat profunde canaliculato, quam elytra multo angustiori, lateribus parum arcuatis postice haud sinuatis, angulis posticis acute subrectis, foveis basalibus sat profundis, basi media retrorsum leviter convexa; elytris striatis (omnibus bene impressis), interstitiis nonnihil convexis (3° puncturis 3 setiferis instructo. Long., 1⅗ l.; lat., ⅘ l. (vix).

Readily distinguishable by the conspicuous tertaceous spots on its elytra most of which are placed so as to form an irregular common fascia somewhat behind the middle of the length of the elytra; also by its small head and narrow prothorax, the latter having its sides less arcuate than is usual in the Australian *Trechi*.

Victoria (Fernshaw).

T. solidior, sp. nov. Minus elongatus; subovatus; sat convexus; robustior; sat nitidus; piceo-niger, ore palpis antennis pedibus elytrorumque marginibus (his anguste) rufo-testaceis; capite modico, sulcis frontalibus profundis fortiter arcuatis; oculis minus convexis; prothorace quam longiori fere sesquilatiori, antice quam postice sat angustiori, longitudinaliter sat profunde canaliculato, quam elytra sat angustiori, lateribus modice arcuatis postice parum sinuatis, angulis posticis leviter obtusis bene determinatis, foveis basalibus magnis leviter impressis coriaceis, basi media retrorsum leviter convexa; elytris striatis, striis subsuturalibus profunde (externis gradatim minus profunde, 7° 8° que vix manifeste) impressis, interstitiis subplanatis (3° puncturis 3 setiferis instructo). Long., 2 l.; lat., ⅘ l.

Near *T. diemenensis*, Bates, from which *inter alia* it is readily distinguishable by the external two striæ of its elytra being all but effaced—scarcely traceable. Resembles *Lecanomerus* in facies.

Victoria (Alpine district).

T. Tasmaniæ, sp. nov. Modice elongatus; subovatus; sat convexus; nitidus; niger, palpis mandibulis antennis basin versus pedibusque rufescentibus; capite modico, sulcis frontalibus profundis fortiter arcuatis; palpis brevibus; oculis minus convexis; prothorace quam longiori ut 3 ad 2 latiori, postice quam antice paullo angustiori, longitudinaliter canaliculato, lateribus sat fortiter arcuatis postice nullo modo sinuatis, latitudine majori sat longe ante medium sita

angulis posticis valde obtusis (fere subrotundatis), foveis basalibus modicis, basi latissime leviter lobata; elytris striatis, striis subsuturalibus profunde (externis gradatim minus profunde, 5°—8° vix vel haud manifeste) impressis, interstitiis sat planis (3° puncturis magnis 3 setiferis instructo). Long., $1\frac{3}{5}$ l.; lat., $\frac{3}{5}$ l.

A *Bembidium*-like species, also resembling *Trechodes gibbipennis* in facies, but with very different palpi, non-gibbous elytra, &c. The basal part of the prothorax is of peculiar shape, its lateral portion almost continuing the line of the lateral outline of the segment for a short distance so that it seems to consist of a very wide and very short lobe.

Tasmania (on a mountain in the Lake District).

TRECHODES (gen. nov. *Trechidarum*).

Mentum dente acuto instructum; ligula setifera (?); palporum articulus ultimus subfiliformis quam præcedens parum brevior (fere ut *Perilepti*); labrum transversum ciliatum; caput supra utrinque fortiter arcuatim sulcatum; antennæ elongatæ, articulo basali glabro; tarsi elongati, maris anticorum articulis basalibus 2 dilatatis; corpus convexum, glabrum; elytra (striis subsuturali et marginali exceptis) haud striata.

T. (*Bembidium*) *secalioides*, Blackb.

It is necessary to found a new genus for the reception of *Bembidium secalioides*, Blackb., which I attributed doubtfully to *Bembidium* (Proc. L.S., N.S.W., 1890, p. 786), remarking that it might eventually have to be so treated. In spite of its *Bembidium*-like facies I find that it is in reality allied to *Trechus*, The palpi having their apical joint elongate (as in *Perileptus*) and the frontal sulci of the head being strongly arched as in *Trechus*. Unfortunately I have not a specimen for dissection, so that a satisfactory examination of the ligula is not practicable but I can see that it is setiferous and I think it is considerably shorter than its paraglossæ. The form of its palpi associate this genus with *Perileptus* from which however its elongate tarsi, strongly convex form, and very different facies, readily separate it. *Bembidium bipartitum*, Macl., is likely to be a member of this genus.

T. gibbipennis, sp. nov. Sat convexus; glaber; nitidus; niger; antennis pedibusque nonnihil picescentibus; capite supra utrinque fortiter arcuatim sulcato, sulcis pone oculos continuis; prothorace quam longiori vix latiori, subglobulo, longitudinaliter leviter canaliculato, tenuissime marginato, supra lævi (puncturis nonnullis in sulco transverso subbasali positis exceptis), utrinque fovea in lobo basali pone angulos

posticos impresso, his minutis subdentiformibus, lobo basali latissimo valde elongato; elytris striis singulis subsuturalibus et marginalibus profunde impressis (illis antice abbreviatis), alibi nullo modo striatis, sulco profundo transverso discoidali paullo pone basin instructis, ante hunc sulcum gibbosis, punctura magna discoidali mox pone medium aliaque minore anteapicali impressis; tarsis minus elongatis. Long., $1\frac{1}{5}$ l.; lat, $\frac{2}{5}$ l.

This extraordinary little insect is certainly I think allied to *T. secalioides*, Blackb., though it is quite possible that the discovery of additional species may result in its being convenient to separate it generically under a new name. The two seem rightly associated as a distinct group of *Trechides* having the palpi of *Perileptus* (like those of *Bembidium* except that the apical joint is greatly elongated), but with the convex form of a *Bembidium* and the elytra brilliantly nitid and (except the very deep subsutural and marginal striæ) without a trace of striation. In the present species the large anterior discal elytral puncture of *secalioides* is replaced by a deep transverse sulcus in front of which the elytra are gibbous. The possibly generic distinctive characters of this species as compared with *secalioides* consist in its evidently shorter tarsi (especially the hind pair) and antennæ, the excessively fine marginal edging of its prothorax and the curious basal lobe of the latter, the lateral outline of which so nearly continues the outline of the true lateral margin of the segment that to a casual inspection the hind angles appear as small denticulations of the margin placed at a distance from the base equal to about a quarter of the length of the whole segment. The superficial characters of this insect are so remarkable that there can be no difficulty in recognising it whatever may be thought of its generic position.

Tasmania (on a mountain in the Lake District).

TACHYS.

Mr. Sloane (Proc. L.S., N.S.W., 1896, III.) has furnished a very valuable memoir "on the Australian *Bembidiides* referable to *Tachys*," &c. *Tachys* is a genus particularly difficult to define as no one character can be specified distinguishing it from *Bembidium*. Lacordaire makes it a section of *Bembidium*. Dr. Schaum treats it as a good genus and limits it to species having both a recurved elytral striole and anterior tibiæ obliquely truncate at the apex. There exist numerous species in which it is difficult to say whether there is a true elytral striole,—that character being either very faint or the striole being confused with one of the systematic striæ. The absence of the striole is in some species accompanied by the presence of the tibial charac-

ter in the most exaggerated form; on the other hand there are species in which the tibial character is very faintly defined,—some in which it is difficult to determine whether their tibiæ place them in *Bembidium* or *Tachys*. Mr. Sloane has defined *Tachys* on the tibial character alone and has admitted into the genus species in which the elytral striole is decidedly wanting. It is to be noted that he has adopted this definition with great diffidence, and has distinctly stated that it does not satisfy his ideas of desirable generic grouping in the *Subulipalpi*, being adopted provisionally. I think that he is quite right in exercising great care to avoid the formation of genera which the future discovery of additional species is likely to invalidate, and that where a describer deems a new species before him likely to be subsequently proved (by the finding of intermediate forms) to be merely an aberrant race of some known genus it is better to refer it to that genus—at the same time specifying clearly the characters which render its position doubtful. I am not therefore prepared to challenge Mr. Sloane's action in this matter or his opinion that a more satisfactory grouping of Australian *Bembidiides* is attained by separating the species having the tibiæ characteristic of *Tachys* from those having them of the typical *Bembidium* form irrespective of their elytral sculpture, than by making the elytral sculpture of importance as a generic character. In fact Mr. Sloane has concentrated attention on the *Carabidæ* so much more than I have done, and I so generally agree with his conclusions, that I am much disposed to yield to his authority. It seems, however, desirable that I should make these remarks because my own contributions to the descriptions of Australian *Bembidiides* have followed a different line and I have given as much prominence to elytral as to tibial sculpture in generic apportionment, not however relying absolutely upon either and in the case of species where those characters were not both of them of either the *Tachys* or the *Bembidium* type adding the consideration of facies so that one of my species (as noted below) has not been placed by me as Mr. Sloane would now place it.

T. (*Bembidium*) *victoriensis*, Blackb. This species was placed by me in *Bembidium* with the remark that although having the tibiæ of a *Tachys* it has elytral sculpture inconsistent with a place in that genus. Its facies being decidedly more accordant with *Bembidium* than with a typical *Tachys* I apportioned it to the former genus. On Mr. Sloane's conception of *Tachys*, however, it must stand in that genus rather than in *Bembidium*. In Mr. Sloane's tabulation of Australian species of *Tachys* its place is with *T. brunnipennis*, Macl., and *ectromioides*, Sloane, from both of which it differs by its elytra being fully and very deeply striate and having their interstices strongly convex.

T. similis, Blackb. When I described this insect I omitted to remark on (and, indeed, to notice) its close resemblance to the European *T. scutellaris*, Germ.; I scarcely know how to separate it from that species by any other character than the much shorter and feebler frontal sulci of the head,—a distinction, however, sufficiently strongly marked to form a perfectly satisfactory specific difference.

T. Adelaidæ, Blackb. A comparison of this species with examples of *T. transveraicollis*, Macl. (compared with the type by Mr. Sloane) has satisfied me that the two names are founded on one insect. Sir W. Macleay's description is quite insufficient to have indicated this identity. Sir W. Macleay's name has priority.

CILLENUM.

C. (*Bembidium*) *Mastersi*, Sloane. This insect (described by Mr. Sloane as a *Bembidium*) is extremely close to the European *C. laterale*, Sam. Its coloring scarcely differs, but it is of decidedly more elongate form and has evidently longer and less stout antennæ. The genus *Cillenum* has not been previously recorded as Australian.

BEMBIDIUM.

The Australian species of *Bembidium* have been reduced to small numbers by Mr. Sloane, with whose conclusions I cordially agree subject to the slight doubt expressed above as to his treatment of the distinction between *Tachys* and *Bembidium*. I have (above) removed from *Bembidium* two more species that he had left in it, which leaves in it ten species (three of them from Queensland, named by Macleay,—two of these practically undescribed,—unknown to Mr. Sloane or to myself). One of them (*B. bipartitum*, Macl.) I have conjectured (above) to be a *Trechodes*, but at any rate it is not a *Bembidium* as the apical joint of its palpi is described as elongate. *B. amplipenne*, Macl., and *sexstriatum*, Macl., if true *Bembidia* are certainly I think distinct from all of the genus that have been described by other authors. There thus remain only seven Australian species (including the two described below) that can be confidently referred to *Bembidium*. I have the types or thoroughly authentic specimens of all of them before me. Their distinctive characters may be tabulated as follows:—

A. Pronotum widely margined, the hind angles strongly explanate ... ... *Jacksoniense*, Guér.
AA. Pronotum not as above.
B. Elytra fully striate or seriate-punctulate.
C. Head scarcely convex longitudinally in the middle between the eyes ... ... *Riverinæ*, Sloane.
CC. Head strongly convex longitudinally in the middle between the eyes.

D. Elytra with a conspicuous (but not sharply limited) depression a little behind base . *dubium*, Blackb.
DD. Elytra without the sub-basal depression.
E. The seventh elytral stria strongly defined *proprium*, Blackb.
EE. The seventh elytral stria subobsolete ... *Hobarti*, Blackb.
BB. The six inner striæ (only) of the elytra present *errans*, Blackb.
BBB. The five inner striæ (only) of the elytra present ... ... *wattsense*, Blackb.

B. Hobarti, sp. nov. Subovatum; minus convexum; sat nitidum; nigricans, antennarum basi mandibulis pedibusque rufescentibus; capite utrinque profunde sat recte sulcatum; prothorace quam longiori circiter sesquilatiori, antice quam postice multo latiori, longitudinaliter canaliculato, utrinque ad basin minus profunde impresso, lateribus antice fortiter rotundatis postice breviter rectis anguste marginatis, angulis posticis minutis sat rectis, latitudine majori ante medium sita, parte basali transversim depressa, basi fere recta; elytris fortiter punctulato-striatis (stria 6ª quam præcedentes minus fortiter impressa, 7ª fere nulla, 8ª margini fere contigua), interstitiis manifeste convexis, striola recurva haud plane carenti; tibiis anticis ad apicem latis, supra vix manifeste oblique truncatis. Long., $1\frac{1}{5}$ l.; lat., $\frac{1}{2}$ l.

This is a species that illustrates the difficulty of distinguishing *Tachys* and *Bembidium*. It has an irregular sulcus near the apex of the elytra which is somewhat of the nature of a recurved striole and the extreme apical part of the upper outline of its front tibiæ seems from a certain point of view obliquely truncate, although it would be equally correct to say that the apical outline of the tibiæ (*i.e.*, the line joining the upper and lower outline of the tibiæ) is a curve. I do not think that Mr. Sloane would place the insect in *Tachys* as having the upper outline of the tibiæ genuinely obliquely truncate at the apex. It is not very near any other *Bembidium* known to me. The seventh stria of its elytra is extremely slight but is distinctly traceable under a lens as a row of fine punctures, so that this species must be ranked among those having fully striate elytra. The two discal punctures of the third elytral interstice are small and inconspicuous, the sub-apical puncture more distinct.

Tasmania (near Hobart).

B. wattsense, sp. nov. Ovale; subelongatum; sat convexum; nitidum; nigrum, antennarum basi mandibulis tibiis tarsisque rufescentibus; capite utrinque profunde sat recte sulcatum; prothorace quam longiori haud plane sesquilatiori, antice quam postice multo latiori, longitudinaliter canaliculato, utrinque ad basin sat profunde impresso, lateribus antice fortiter rotundatis postice rectis anguste marginatis, angulis posticis rectis, latitudine majori ante medium sita,

parte basali transversim depressa, basi fere recta; elytris punctulato-striatis, striis 6ª 7ª que omnino carentibus, interstitiis sat planis (3ª puncturis setiferis 3 modicis impresso), striola recurva haud plane carenti; tibiis anticis ad apicem latis, supra vix manifeste oblique truncatis. Long., $1\frac{1}{5}$ l.; lat., $\frac{1}{2}$ l. (vix).

Rather close to the preceding (*B. Hobarti*) but narrower and more convex, the prothorax more decidedly cordiform with the basal impressions much better defined, the elytra less deeply striate with the stiæ much more distinctly punctulate, the sixth and seventh striæ quite wanting (not even represented by punctures). In the typical specimen the third and fourth elytral striæ are abbreviated in front at the front setiferous puncture of the third interstice where they meet (it being placed at the edge of the third interstice and the fourth striæ bending over to it). This may be an accident of the individual as I find a somewhat similar arrangement of striæ on one (but not on the other) elytron of *B. Hobarti*.

Victoria (Dividing Range; on bank of the Watts River).

DYTISCIDÆ.

ANTIPORUS.

A. (Hydroporus) collaris, Hope. I have before me a male (from Port Darwin) and two females (from King's Sound) which there is little doubt appertain to this species. The Rev. H. Clark (Journ. Ent. I., p. 412) quotes Westwood for the presence of four abbreviated stria-like lines very faintly impressed on each elytron. On the elytron of the females before me there are faint traces of four lines (only visible from a certain point of view, and so faint as to be hardly worthy of mention) but I cannot find them in the male. As in all other respects (especially in the remarkable pronotum) these insects agree perfectly with the description of *A. collaris* I feel no doubt as to the identification, although the four lines are less distinct than one would expect from even the phrase "very faintly impressed." This view of the matter is confirmed by one of my specimens being from Port Darwin, which is near Port Essington (Hope's locality). Mr. Masters in his Catalogue has placed *H. collaris*, Hope, in the genus *Antiporus*; I cannot find any published note suggesting that place for it, but nevertheless *Antiporus* seems to me of existing genera that in which *H. collaris* should stand, as its hind tibiæ are punctured as in that genus and its epipleuræ are distinctly broad in the posterior part (quite as broad as in *A. Blakei*, Clk.). Nevertheless I am of opinion that if Dr. Sharp had had my specimens under inspection when he wrote his great work on

the *Dytiscidæ* (in which he states that he can give no information about *H. collaris*) he would have formed a distinct genus for them. I am not in a position to do so myself as I have not made a sufficiently special study of the *Dytiscidæ* to enable me to furnish a satisfactory diagnosis without treating a male example in a manner that my unique male would not bear, and therefore I shall leave the species in *Antiporus* remarking however that it differs from all those which Dr. Sharp placed in that genus in respect of the sculpture of its pronotum (the lateral margins being very widely thickened and raised, with a sulcus or deep stria separating the marginal from the discal portion) and in respect of its sexual characters. The front tibiæ of the male have an external median tooth similar to, but a little smaller than, the tooth on the middle tibiæ of *A. Blakei*; the front tarsi are somewhat feebly dilated and a little longer than those of the female; my specimen has lost one each of the front and middle tarsi, on the remaining ones I can find but one claw, though I am suspicious of a claw having been broken off the middle tarsus. The front tarsus seems to have its claw springing directly from the apex of the third joint as though the basal part of the claw joint were wanting, but it is quite possible that that appearance would be found to be deceptive if a fresh specimen whose tarsi would bear manipulation could be examined. The posterior tibiæ and all the femora are unarmed. In one of the specimens mentioned above the base of the pronotum is rufous at the sides, which suggests the idea of identity with *H. gravidus*, Clk. (also described from Port Essington) and I feel no doubt that *H. undecim-maculatus*, Clk., is closely allied, if not a variety of the same species.

NECTEROSOMA.

N. costipennæ, Lea. This insect is no doubt identical with *H. penicillatus*, Clk., one of the commonest and most widely distributed as well as most variable of the Australian water beetles. Dr. Sharp, in his work on the *Dytiscidæ* of the world, includes under the name forms with and without elytral carinæ, in which I have no doubt he is right as I find that the forms with strongly carinate, and those with non-carinate, elytra are connected by forms in which the elytral carinæ are more or less feeble. Even if the carinate forms represent a species distinct from the non-carinate ones, however, it was the carinate form that Clark described under the name *Hydroporus penicillatus* and therefore the non-carinate form, if either, is the one that would need a new name.

PLATYNECTES.

P. subænescens, Lea. Mr. Lea has been good enough to send me a specimen of this insect. He distinguishes it from *ænescens*,

Shp., only by its less metallic tone of coloring and the absence of a testaceous spot on its elytra. The size he assigns to it is slightly larger than that Dr. Sharp mentions as the size of *æneescens*. Presumably Mr. Lea has, since the time when he described *P. subæneescens*, taken additional specimens, as the example sent to me (from Beverley, W.A.) has a testaceous spot on each elytron similar to that of *æneescens*. Hence the differences mentioned are reduced to somewhat larger size and less distinctly æneous coloring. Nevertheless, if my specimen of *æneescens* is rightly named (as I think it is), I take Mr. Lea's species to be a valid one as it is (my specimens of both are females) of considerably different form, having more rounded sides and being distinctly less blunt at the hind apex. *P. subæneescens* belongs to Dr. Sharp's first group of *Platynectes*, and is very distinct from all its described Australian congeners except *æneescens*.

GYRINIDÆ.

MACROGYRUS.

M. fortissimus, sp. nov. Fem. Late ovalis; minus convexus; nitidus; supra nigroæneus vix cuprascens; subtus piceus, palpis pedibus abdomineque obscure rufescentibus; supra subtilissime coriaceus; elytris striolis minimis transversis subtilissime impressis, obsoletissime regulariter striatis, interstitiis vix manifeste (alternis quam cetera nonnihil magis distincte) convexis, ad apicem leviter dehiscentibus late subtruncatis, angulis externo bene definito sed nullo modo acuto (mediano nullo) suturali subrotundato; tibiis anticis apicem versus modice latis, angulo externo apicali obtuso sed extrorsum manifeste prominentibus; pygidio sat dense fulvopubescenti. Long., $8\frac{1}{4}$ l.; lat., $4\frac{2}{5}$.

A large species (not smaller than *M. rivularis*, Clk.), at once distinguishable from all its described Australian congeners except *M. Howitti*, Clk., by the absence of longitudinal elytral sulci. It differs from the description of *M. Howitti*, *inter alia*, by its large size, its extremely wide form, the absence of metallic blue and green coloring from its lateral margins and the presence of quite distinct (though very faint) striæ on its elytra. Compared with specimens (female) rom Tasmania which agree well with the description of *M. Howitti* the present species differs (apart from the distinctions noted above) by the finer and closer transverse striolation of its elytra and by the striolæ appearing very closely and finely zigzagged,—an appearance that seems (under a very strong lens) to be caused by the presence of minute punctures interrupting their outline. The elytral quasi-striæ are nine in number, and the external striæ are scarcely more distinct than those near the suture. The apex of the elytra

should perhaps be designated "doubly truncate, with the two truncate faces meeting in an extremely obtuse and non-prominent angle."

N.S. Wales (Blue Mountains).

M. opacior, sp. nov. Fem. Ovalis; minus latus; depressus; in elytris sat opacus; nigro-piceus, palpis pedibusque dilutioribus, elytris suturam versus manifeste rufescentibus; supra subtilissime coriaceus; elytris striolis et lineis subtilibus elevatis brevibus transversis instructis, in parte laterali sulcis 4 profunde impressis (in parte altera vix manifeste striatis), ad apicem dehiscentibus et ut *M. rivularis*, Clk, sinuatis; tibiis anticis ad apicem extus fere recte angulatis. Long., 6 l.; lat., 2½ l.

Readily distinguishable from all its described Australian allies by its opaque reddish-brown elytra. It agrees with *M. rivularis*, Clk., and *M. latior*, Clk., in the sinuate apical outline of its elytra; differing from the former *inter alia* by its much smaller size and from both in its elytra having only four sulci in their lateral portion and scarcely any trace (even close to the base) of any striæ between the sulci and the suture. On the anterior portion of its elytra very fine short elevated lines take the place of the impressed striolæ usual in the genus.

Victoria (Mt. Macedon); sent by Mr. Kershaw.

M. paradoxus, Regimb. See note (below) on *Dineutes Gouldi*, Hope.

M. (*Gyrinus*) *obliquatus*, Aubé. In Mr. Masters' Catalogue this species is said to be widely distributed in Australia. Aubé quotes it as common to Australia and the "Iles de la Sonde." Regimbart in his Monograph of the *Gyrinidæ* gives "Timor" as its habitat. I have examined a large number of *Gyrinidæ* from different parts of Australia, but have not seen any which agree with the description of *obliquatus* and consider that further evidence is required to establish the occurrence in Australia of that insect.

DINEUTES.

D. Gouldi, Hope. I have before me examples from N. Australia (one of them from Port Darwin, near the original locality) which I believe, in spite of certain discrepancy with the description, to be this species, the coloring, size, &c., being sufficiently notable to make it improbable that two species from the same locality would agree in respect of them. The obstacle to considering this identification certain is that the description calls the elytra "*trispinosa*" and adds the information that the median spine is larger than the two lateral ones,—whereas in the insect before me each elytron has only *two* spines. In one example I

observe that the elytra including their sutural spines are closely in contact with each other at the apex and might be regarded at a casual glance as having three spines on the conjoined elytra (the two sutural spines appearing as one). Although I must admit that Hope's Latin diagnosis (the lateral spines being called "*bini*") *strictly* implies six spines on the two elytra, I cannot help thinking that Hope used the word "*bini*" instead of "*duo*" carelessly and that his "*trispinosa*" refers to the fact that the two conjoined elytra present the appearance of being (together) trispinose. Otherwise it is certainly remarkable if in the one locality there are two species agreeing in general characters that render them particularly distinct among their allies of the same family yet differing in the armature of their elytral apices. I have both sexes of this insect before me. It is further to be noted that this insect is not a true *Dineutes* but a *Macrogyrus* and is certainly, I think, *M. paradoxus*, Regimb., of which M. Regimbart remarks that in general appearance "it resembles a *Dineutes* much more than a *Macrogyrus*." Unless Hope's type is in existence I do not see much prospect of the identity of *D. Gouldi* being conclusively determined. If some Coleopterist in England could ascertain whether the type is in the Oxford University Museum and if so send me a description or figure of tho outline of the apical portion of its elytra and also report as to whether the specimen has a distinct scutellum I should greatly value the information.

D. australis, Fab., and *rufipes*, Fab. I suspect that as far as Australian specimens are concerned these names refer to but one species, which is widely distributed in Central and Northern Australia. I notice that *D. australis* is attributod to the East Indies as well as to Australia and it may well be that the two *species* are distinct but that *australis* nevertheless has been incorrectly quoted as Australian. Unfortunately I am not able to refer to all the literature bearing upon the question, but the descriptions before me (including those of Fabricius) seem to me as if they might have been founded on only one species. I should be very glad if anyone could throw any fresh light upon this subject.

PALPICORNES.

HYDROPHILUS.

H. scissipalpis, sp. nov. Modice latus, postice sat obtusus; nitidus; piceo-niger, antennis palpisque testaceis, pedibus anticis totis femoribus 4 posterioribus et abdominis maculis lateralibus rufis, tarsis fulvo-ciliatis; prothorace brevi, cum capite ut *H. albipedis*, Cast., et *H. latipalpi*, Cast., punctulato, lateribus leviter arcuatis, angulis posticis rotundatis, basi utrinque latera versus rotundatim retrorsum dilatata;

scutello lævi; elytris triseriatim punctulatis, prope apicem haud seriebus additis impressis; lamina prosternali postice concava; carina sternali postice sat acuta, vix pone coxas posticas producta; sterno breviter pubescenti.

Maris palporum maxillarium articulo penultimo apicem versus intus leviter compresso-dilatato, paullo ante apicem subito angulatim angustato; tarsorum anticorum articulo apicali subtus laminato-dilatato; unguibus anticis modice robustis, minus arcuatis, externo quam internus fere duplo longiori.

Feminæ palpis tarsisque simplicibus. Long., 13—15 l.; lat., 6—6½ l.

This species differs from the previously described Australian *Hydrophili* as follows; from *gayndahensis*, Macl., by its very much shorter sternal carina; from *brevispina*, Fairm., by the very different front claws of the male, different colors, &c.; from *albipes*, Cast., by the much less numerous rows of punctures on its elytra near the apex, the differently shaped penultimate joint of the male palpi, the very much greater inequality of the front claws of the male, the basal outline of the prothorax, the evidently more rounded basal angles of the prothorax, &c.; from *latipalpus*, Cast., by the much less numerous rows of punctures on its elytra near the apex, the extremely different male characters, the colors, &c. *H. ruficornis*, Klug, is unknown to me in nature and is insufficiently described by its author, but from Fairemaire's remarks on it in the Journ. Mus. Godeff, p. 80, that species evidently has a very much longer sternal carina and apparently its prosternal lamina is not concave posteriorly.

Central Australia.

H. gayndahensis, Macl. This species is practically undescribed, —the quasi-description merely stating that its sternal carina passes the extremities of its hind femora, and that its palpi tarsi and fringing hairs are reddish. There is nothing in this to distinguish it from *H. ruficornis*, Klug.

HISTERIDÆ.

CHLAMYDOPSIS.

C. comata, sp. nov. Nitida; nigro-picea, antennis pedibus elytrisque (his piceo-umbratis) castaneis; capite grosse granuloso-ruguloso; prothorace transverso, supra ad latera late explanato et alte reflexo, haud punctulato, ante basin utrinque longitudinaliter profunde strigato; elytris lævibus, humeris ut processus cornua magna simulantes (his ad apicem penicillam pilorum aureorum valde elongatorum ferentibus) productis, lateribus pone humeros ut cristæ magnæ (his antice penicillam ut humeri ferentibus) elevatis; propygidio pygidioque sat fortiter punctulatis; pedibus minus elongatis. Long., 1½ l.; lat., 1⅓ l.

This species is evidently congeneric with those that I have previously described under the generic name *Chlamydopsis*. It is distinguishable from all the species hitherto attributed to that genus by, *inter alia*, its extremely nitid and punctureless elytra as well as by the extraordinary humeral horn and lateral crest that project from each elytron and the thick pencil of very long golden hairs (nearly long enough to reach back to the propygidium) that rise from the apex of the humeral process and the front of the summit of the lateral crest. A single specimen was found in a pool of water.

South Australia (near Woodville).

BUPRESTIDÆ.

MELOBASIS.

M. interstitialis, sp. nov. Minus nitida; supra viridi-æenea, prothoracis angulis posticis scutelloque purpureis, elytrorum costis interrupte aureo-cupreis; subtus purpureo-cuprea; pedibus anticis viridi-æneis posterioribus obscure subpurpureis, tarsorum articulo ultimo viridi; antennis obscuris; corpore subtus ad latera pedibusque albo-pilosis; capite (fere ut *M. cupreo-vittatæ*, Saund.) plano, confertim granuloso-punctulato, albido-piloso; prothorace quam longiori ut 5 ad $3\frac{1}{2}$ latiori, antice vix angustato, antice et postice fortiter sinuato, fere ut *M. cupreo-vittatæ* punctulato (sc. in disco sat crebre minus fortiter, ad latera grosse rugulose), lateribus subrectis (fere ut *M. Saundersi*, Mast.); elytris fere ut *M. Saundersi* 5-costatis, interstitiis (fere ut *M. Saundersi*) subtiliter confertim subæqualiter punctulatis sed quam hujus speciei puncturis magis concinnis, parte antica haud transversim strigata, lateribus postice sat crebre denticulatis, denticulo suturæ proximo quam ceteri majori; sterno sat longe pone marginem anticum transversim fere recte gibboso, parte mediana antice minus crebre minus fortiter (postice magis crebre magis fortiter) punctulato; segmentis ventralibus basalibus 2 crebre subtiliter (ceteris minus crebre) punctulatis.

Maris quam feminæ pronoti disco magis fortiter punctulato, segmento ventrali apicali postice bi-emarginato trispinoso.

Feminæ segmento ventrali apicali profunde sat anguste emarginato. Long., $7\frac{2}{3}$ l.; lat., $2\frac{1}{4}$ l.

The golden coppery parts of the elytral costæ are the front one-fifth of the first (sutural) costa, a short piece of the second costa slightly in front of its middle, of the third costa a short piece near the base and another behind the middle, of the fourth the hind extremity, and of the fifth a somewhat long piece near the front. This species is notable among those having costate

elytra by the remarkable form of its prosternum, which is transversely gibbous on a space well separated from the front; so that from a certain point of view there appears to be a kind of wheal running across the prosternum, distinctly separated from the front margin of the prosternum, and having its front straight and equally well-defined across the whole of the non-pilose part of the segment. The elytral costæ are more sharply defined than in any other *Melobasis* known to me (*e.g.*, the second being as strong as in *Saundersi*, Mast. (*costata*, Saund.) and the fifth (which is obsolete in *Saundersi*, scarcely marked in *cupreo-vittata*, Saund.) being quite well defined. The middle part of the basal ventral segment is very much more closely punctulate than in either of the species just named. The sides of the prothorax are as straight as in *Saundersi* but the segment is not (as it is in that species) narrowed towards the front.

Australia. Sent to me by Mr. French.

EUCNEMIDÆ.

DYSCHARACHTHIS.

D. brevipennis, Blackb. In describing this species (Tr. Roy. Soc., Vict., 1899, pp. 217, &c.) I omitted to say that it is found n South Australia (Basin of Lake Eyre).

CHRYSOMELIDÆ.

PAROPSIS.

In Proc. L.S., N.S.W., 1899, p. 520) I expressed the opinion that *P. splendens*, W. S. Macleay, is not a *Paropsis* but should be referred to either *Cyclomela* or *Augomela*. I have since been informed by Mr. Masters that he has succeeded in finding the type specimen and that it is an *Augomela*.

A List of Birds Collected by the Writer in Western Australia during the Last Fortnight of August, 1901, with Notes Thereon.

By Edwin Ashby.

[Read October 1, 1901.]

(*The numbers in brackets supply the references to the species in "Gould's Handbook."*)

Ninox boobook, *Lath.* (Boobook Owl), [36].

Locality.—Bayswater, near Perth.

One male. The coloration is much darker than any specimen of this species I have seen in S.A. collections. The usual spotting is almost entirely absent, and the tail is not barred.

Cheramœca leucosterna, *Gld.* (White-breasted Swallow), [57].

Locality.—Kanowna, W.A.

Nine birds came out of one hole made in the side of the diggers' pits. Probably they had thus congregated together for warmth.

Artamus sordidus, *Lath.* (Dusky Wood Swallow), [73].

Locality.—Speakmans.

Pardalotus ornatus, *Temm.* (Striated Diamond Bird), [84].

Locality.—Speakmans Very numerous.

Strepera plumbea, *Gld.* (Leaden Crow Shrike).

Locality.—Speakmans.

Cracticus nigroqularis, *Gld*, (Black-throated Crow Shrike), [95].

Locality.—Speakmans. Numerous.

Cracticus destructor, *Temm.* (Collard Crow Shrike), [99].

Graucalus melanops, *Lath.* [Black-faced Graucalus), [103].

Pteropodocys phasianella, *Gld.* (Ground Graucalus), [108].

A flock of these birds were about the locality of Speakmans for one day—none noted afterwards. The notes of these birds are most striking, loud cries being uttered while the birds are flying. I did not observe them settle on the ground, once only in the Eucalyptus trees.

Pachycephala rufiventris, *Lath.* [116].

One female from Guilford, near Perth. This specimen differs in several minor details from any South Australian skins of *P. rufiventris*, Lath., I have been able to compare it with.

COLLURICINCLA RUFIVENTRIS, *Gld.* (Buff-bellied Shrike Thrush), [124].

Locality.—Speakmans.

The notes are similar to those of *C. harmonica*, but feeble, lacking richness and power.

OREOICA CRISTATA, *Lewin* (Bell Bird), [131].

One of the commonest birds round Speakmans.

RHIPIDURA PREISSI, *Cabani* (The Western Fantail), [134].

Locality.—Guilford, near Perth.

MICRŒCA ASSIMILIS, *Gld.* (Allied Flycatcher), [150].

Locality —Speakmans.

PSEUDOGERYGONE CULICIVORA, *Gld.* (Western Flycatcher), [157].

Locality.—Bayswater, near Perth.

SMICRORNIS BREVIROSTRIS, *Gld.* (Short billed Smicrornis), [161].

One of the commonest birds at Speakmans. Usually about eight or more in a flock.

PETROICA LEGGI, *Sharpe* (Scarlet-breasted Robin), [165].

Locality.—Guilford, near Perth.

The white spot above the beak is quite as large in these specimens as in South Australian specimens. I have shot one specimen at Albany with a small white spot above the beak, the form described by Sharpe as *P. Campbelli.*

PETROICA GOODENOVII, *V.* and *H.* (Red-capped Robin), [166].

Locality.—Speakmans. Females were fairly numerous, but no males were seen.

ACANTHIZA TENUIROSTRIS, *Zietz.* (Small-billed Tit), [230A].

Locality.—Guilford, near Perth. The only previously-recorded specimens of this species are the two type specimens from Leigh's Creek, South Australia. This is, therefore, the first time it has been recorded from West Australia.

ACANTHIZA UROPYGIALIS, *Gld.* (Chestnut-rumped Tit), [222].

Locality.—Speakmans. This is, I believe, the first record for South-Western Australia.

ACANTHIZA PYRRHOPYGIA, *Gld.* (Red-rumped Tit), [224].

Locality.—Fourteen miles east of Speakmans.

GEOBASILEUS CHRYSORRHOUS, *Quoy* and *Gaim* (Yellow-rumped Tit), [229].

Locality.—Bayswater, near Perth.

PYRRHOLÆMUS BRUNNEUS, *Gld.* (Red Throat), [235].

Very numerous at Speakmans.

CINCLOSOMA CASTANEONOTUM, *Gld.* (Chestnut-backed Ground Thrush), [272].

Locality.—Speakmans.

POMATORHINUS SUPERCILIOSUS, *V.* and *H.* (White Eye browed Pomatorhinus), [294].

Very common at Speakmans.

GLYCIPHILA ALBIFRONS, *Gld.* (White-fronted Honey-eater), [302].

Locality.—Speakmans.

GLYCIPHILA OCULARIS, *Gld.* (Brown Honey-eater), [304].

Locality.—Guilford, near Perth. One male. This skin is considerably more grey in plumage than is a skin I have from York, W.A., collected by myself in 1889. The York skin is decidedly more rufus in coloration, the under side of the head markedly so. The York skin is not sexed. The district is dry, while Perth is a wet district.

PTILOTIS SONORA, *Gld.* (Singing Honey-eater), [307].

Locality.—Fourteen miles east of Speakmans. I did not observe this species west of this point, although common east of that place.

PTILOTIS LEUCOTIS, *Lath.* (White-eared Honey-eater), [311].

Locality. — Speakmans. The specimens collected in this locality are much smaller than those collected by me in the State of Victoria, also the black marking does not extend so far down the breast, but otherwise they are identical.

PTILOTIS ORNATA, *Gld.* (Graceful Honey-eater), [314].

Locality.— Speakmans.

PTILOTIS PLUMULA, *Gld.* (Yellow-fronted Honey-eater), [315].

Locality.—Speakmans.

ACANTHOGENYS RUFIGULARIS, *Gld.* (Spiny-cheeked Honey-eater), [329].

Locality.—Speakmans. Common, but very shy.

ANTHOCHŒRA CARUNCULATA, *Lath.* (Wattled Honey-eater), [331].

Locality.—Guilford, near Perth.

ANELLOBIA LUNULATA, *Gld.* (Lunated Wattle Bird), [333].

Locality.—Guilford, near Perth.

ACANTHORHYNCHUS SUPERCILIOSUS, *Gld.* (White Eye-browed Honey-eater), [340].

Locality.—Guilford, near Perth.

MELITHREPTUS CHLOROPSIS, *Gld.* (Swan River Honey-eater), [350].

Locality.—Guilford, near Perth.

MYZANTHA OBSCURA, *Gld.* (Sombre Minah), [354].

Locality.—Bayswater, near Perth.

MYZANTHA FLAVIGULA, *Gld.* (Yellow-throated Minah), [356].

Locality.—Speakmans. Numerous in the locality.

ZOSTEROPS GOULDI, *Bparte.* (Greenbacked Silver Eye), [361].
Locality.—Guilford, near Perth.

CLIMACTERIS ERYTHROPS, *Gld.* (Red Eye-browed Tree Creeper), [368].
Locality.—Speakmans.

SITTELLA PILEATA, *Gld.* (Black-capped Sittella), [376].
Locality.—Bayswater, near Perth.

PSEPHOTUS MULTICOLOR, *Temm.* (Varied Parrot), [430].
Locality.—Speakmans.

PLATYCERCUS SEMITORQUATUS, *Q.* and *G.* (Twenty-eight Parrot), were very numerous about Speakmans, and a pair of *Climacteris rufa* were seen at the same place. Several other species of birds were seen, but without handling their identification must be doubtful. I saw a skin of *Cacatua Leadbeateri*, Vig. (Pink Cockatoo), which was shot at Goongarrie. I also heard of the same species visiting the Soak, 14 miles due east of Speakmans.

Speakmans, sometimes known as Callion, is situated about 85 miles north of Coolgardie, and about 360 miles from the coast. Only five days were spent there, viz., 16th to 20th August, 1901. Most of the collecting was done at sunrise, as the days were otherwise fully occupied. As far as observation went, the birds had not commenced nesting, but some species appeared to have paired. This may be accounted for from the fact that the winter rains had been very light. Only one day was spent in the neighborhood of Perth, viz., 26th August.

Fossil Polyplacophora from Eocene Beds of Muddy Creek, Mornington (Schnapper Point) and Moorabool, Victoria, with Definitions of Nine New Species, and Notes on Others.

By Edwin Ashby and W. G. Torr, LL.D., &c.

[Read October 1, 1901.]

Plate IV.

The very valuable collection of Fossil Polyplacophora dealt with in this paper has been placed in our hands for description by the late Professor Ralph Tate, to whom belongs the honor of having brought together such an interesting series, the major part having been collected by himself and Mr. J. Dennant, of Victoria. One very interesting feature of this collection is the close affinity so many bear to living forms. The collection numbers in all 32 valves, comprising 17 or 18 species, and representing seven different genera. The whole collection is deposited in the University Museum, Adelaide.

1. Lorica compressa, *n. sp.* Pl. iv., fig. 6.

One example of median valve.

General Appearance.—Strongly carinated, side slope straight, color yellowish to dark-brown. The valves are produced forward in an anterior beak.

Lateral Area.—Much raised, ornamented with five, increasing to eight, at the insertion plates, granulose ridges. The granules near the girdle are arranged in transverse rows.

Pleural Area.—This area is longitudinally ribbed with 16 strong ridges, the interspaces are deep, the anterior portion is about the same width as the ridges, the posterior portion about double the width. There is a suggestion that the ridges were crossed by shallow transverse ridging.

Dorsal Area.—This area is not separated from the pleural, the longitudinal ridging being continued right over the jugum.

Measurement.—Greatest width between the slopes, 24 mm.; greatest width of slopes, 11 mm.; greatest length of slope, 18 mm The longitudinal measurement of the dorsal area is 12 mm.; divergence, 85°. The insertion plates and sutural laminæ are missing.

Remarks.—This species differs from *Lorica volvox* and *L. affinis* in the strong radial ribbing of the lateral areas and the great number of the longitudinal ribs in the pleural area, but it corresponds with *L. affinis* in the compression of the side slopes. The decussation of the interspaces present in *L. affinis* is absent in this species.

2. Lorica affinis, *n. sp.* Pl. iv., fig. 7.

One example of median valve.

General Appearance.—Carinated, side slope slightly curved, though almost straight, color pale yellowish-brown

Lateral Area.—Distinctly raised, ornamented with six radial rows of somewhat distant pustules which rise out of very shallow ridges.

Pleural Area—Longitudinally ribbed with twelve narrow, but strong ridges; the interspaces are fully three times the width of the ribs, and nearly flat; these ridges have a slight tendency to granulation, but the transverse striæ which produce the same appearance in its congener, *Lorica volvox*, are not discernible in this species. The megalopores are very pronounced, giving under a powerful lense a strongly decussated appearance.

Measurement.—The greatest width between the slopes is 20 mm.; width of slopes, 10 mm; length of slopes, 15 mm.; divergence, 90°.

Insertion plates have broken away; there is no indication of teeth.

Remarks.—This species so closely resembles *Lorica volvox*, Rve, that it almost justifies its being referred to that living species; the most marked difference is in the compression of the valves. In *volvox* there is a slight widening or separating of the two slopes at their extremities, whereas in the species now described there is a slight drawing together. The other differences are the absence of transverse striæ (but this may be accounted for through the wearing of the shell) and the more decussated effect produced by the megalopores. Its close affinity to *Lorica volvox*, Reeve, is undoubted.

3. Loricella gigantea, *n. sp.* Pl. iv., fig. 3.

One specimen of anterior valve only.

General Appearance—Color dirty-white or wainscot-brown, shape exceptionally broad (nearly twice as broad as long) and very flat, anterior third of valve curved downwards, other two-thirds practically straight except at the apex, which is very slightly elevated.

Sculpture.—Radially ribbed with very numerous, pronounced, bifurcating riblets, which are crossed by about 26 concentric wrinkles; while these are clearly defined, some are more so than

others. These wrinkles break up the riblets into more or less pronounced granules. The eves only slightly overhang. Slits 18, at irregular distances. Margins of teeth are irregular, more crenulate than pectinate. The strong pectination of its congener, *Loricella Angasi*, Ad. and Ang., is quite absent, but the teeth are deeply grooved to their bases, very little indication of this being present in the living form. In *L. Angasi* a deep groove runs from each slit to the apex. In the fossil under review there is no groove, but its place is occupied by a slightly raised rib.

Inside of Shell (Articulamentum).—The valve, except where stained, is paler than the tegmentum, a rib running from each of the slits to the apex, except that from the posterior slit, which is almost parallel with the posterior margin of valve.

Measurement.—Length, 16 mm.; breadth, 33 mm.; elevation, 7½ mm.

Locality.—Mornington.

Remarks.—As compared with *Loricella Angasi*, the valve is much flatter, is convex instead of concave. The coarse radial ribs, nine or more in number, present in *L. Angasi*, are entirely absent, the riblets being evenly distributed over the whole valve. The largest specimen of *L. Angasi* known to us measures 68 mm. by 44 mm. This valve is fully one-fourth larger than the anterior valve of that specimen, and therefore we may conclude that when living this ancient form would have measured fully 85 mm. by 55 mm.

4. Plaxiphora concentrica, *n. sp.* Pl. iv., fig. 8.

One example of posterior valve only.

General Appearance.— Broad, rounded. Color pale-brown, slightly olivaceous. The tegmentum is posteriorly bent over, and continued for some distance on the underside of shell. Mucro evidently postmedian, though much worn. The anterior portion of shell well preserved, showing six strong concentric ribs, each following closely the contour of the margin of the shell. There are evidences that these ribs were continued without any break right round the posterior margin, though the ribbing in this part of shell is less strong, and the ribs are closer together. No other sculpture is discernible on the tegmentum. Insertion plates unslit in the posterior valve.

Measurement. — Posterior valve, total width 17 mm., total length, 10 mm.; width of tegmentum only, 15 mm.; length of tegmentum only, 7 mm.

Inside.—Articulamentum white, sinus 4 mm. wide at apex, 8 mm. at widest part. Sutural laminæ produced beyond the tegmentum, 4½ mm. The sutural laminæ and insertion plates are remarkably posteriorly thickened. The two dorsal pits and lateral grooves are very deep.

Remarks.—This shell is allied to the living forms *Plaxiphora petholata*, Sby, and *P. glauca*, Q. and G., rather more so to the latter than to the former. It is more strongly concentrically ribbed, more evenly rounded, sinus narrower, sutural laminæ twice the length, the anterior margin of tegmentum slightly produced forward in the centre of the sinus, and the inside is white instead of greenish-blue. The microscopic vermiculate wrinkling is quite absent in the specimen under description.

5. Plaxiphora gellibrandi, *n. sp.* Pl. iv., fig. 1.

One example of posterior valve.

General Appearance.—Broad, flat, jugum slightly raised, side slope nearly straight. Color blackish, with irregular streaks of green. A pale broad wedge-shaped mark on dorsal ridge.

Mucro.—Post median, slightly raised.

Dorsal Area.—Slightly raised and ornamented with a broad whitish wedge-shape mark. A shallow curved diagonal rib runs from the mucro forward, keeping near the margin of valve. The whole of the valve is ornamented with the same peculiar sculpture that is present in *Plaxiphora petholata*, Sby., and which Sowerby in his description describes as a microscopic pattern resembling a dense punctulation, united with a minute zigzag or vermiculate wrinkling.

Measurement.—Posterior valve, total width 14 mm., total length 8 mm.; width of tegmentum only, 11 mm.; length of tegmentum only, 5 mm.

Inside.—Articulamentum white, sinus 3 mm. at apex, increasing to 6 mm.; sutural laminæ produced beyond tegmentum 3 mm.

The eves are shallow and spongy. The articulamentum of insertion plates and sutural laminæ is greatly thickened. The two dorsal pits and corresponding lateral grooves are very deep.

Locality.—Eocene beds, Gellibrand, Victoria.

Remarks.—This species very closely resembles *P. petholata*, Sby. The inside pits and lateral grooves are deeper, and the inside color white instead of greenish blue. The shell is also broader, and the anterior margin of tegmentum is slightly produced forward.

6. Acanthochites (Notoplax) granulosus, *n. sp.* Pl. iv., fig. 9.

Two examples of median valves.

General Appearance.—Carinated beaked, side slope straight, except lateral area, which is reflex; color mottled in two shades of green, somewhat bleached.

Dorsal Area.—This area is clearly defined, being broadly wedge shape, produced forward in a distinct beak, which is slightly bent downwards. A shallow depression separates this area from the pleural. Sculpture consists of about a score of

longitudinal, closely packed granulose riblets. The granules increase in definition towards the margin of the pleural area, where they will be more correctly described as longitudinal rows of granules.

Pleural Area.—In this area the rows of granules are radial, the rows being separated, widely apart, and very regular. In this area the granules become large, digitate, in some cases pointed, inclined very much forward, the apex of one just reaching to the base of the one in front of it. Where the apex is broken off the pustules are seen to be hollow.

Lateral Area.—Raised or recurved, clearly defined, the pustules being rounded and granulose, becoming crowded and irregularly placed as they approach the posterior margin of valve.

Inside.—The articulamentum was probably white. The insertion plates are well produced, though in the specimens under examination rather broken, and apparently unslit. The upper surface of the sutural laminæ is irregularly grooved, sinus broad.

Measurement.—Width of valve, 7 mm.; length of valve, 7 mm.; length of slope, 5 mm.; divergence, 100°.

Locality.—Schnapper Point.

7. Acanthochites rostratus, *n. sp.* Pl. iv., fig. 5.

One median valve.

General Appearance.—Carinated, side slope straight, strongly beaked. Color porcelain white.

Dorsal Area.—Wedge shape, much raised, convex, strongly beaked, the beak bent downwards This area is smooth and glossy under an ordinary pocket lense, but under a fairly high power it is seen to be pitted with irregular shallow pitting, highly polished.

Lateral and Pleural Areas.—These areas are hardly separable. The shell is a little thickened, and the sculpture a little coarser in the lateral area. The ornamentation consists of a number of somewhat irregular longitudinal rows of finger-shaped flattened pustules. The pustules are set diagonally in the rows, and increase to double the size as they reach the margin of the shell. The posterior margin of valve is bent downwards.

Measurement.—Longitudinally, 3 mm.; breadth, 5 mm.; divergence, 105°.

Inside.—White, insertion plates and sutural laminæ not large, sinus broad and shallow, only indicated by a slight sinuosity of outline.

Locality.—Schnapper Point.

8. Chiton fossicius, *n. sp.* Pl. iv., fig. 4.

One example median valve.

General Appearance.—Valve narrow, carinated, side slopes nearly straight. Color pale olivacious buff.

Lateral Area.—This area is separated from the pleural area by a much raised, broad, diagonal rib. This rib occupies fully one-half of the area; on the other half are two shallow radial ribs.

Pleural Area.—This area appears to have been sculptured right up to the dorsal ridge, with about 13 sharply chiselled, imbricating longitudinal ribs. The sutures between the ribs are deeply cut, and end as they reach the raised diagonal rib of the lateral area in a very deep pit. So deep are these pits that with the naked eye they appear to be perforations through the tegmentum.

Dorsal Area.—This area is much worn, but, as before stated, there are indications that the ribbing of the pleural area was continued right over this area. The valve is slightly beaked, which is smooth, no striæ being discernible.

Measurement.—Greatest width between the slopes, 10 mm.; greatest width of slope, 4 mm.; length of slope, 7 mm.; divergence, 95°.

Remarks.—Under a strong lense the whole valve, except the beak, is found to be decussated or ornamented with a network of perforations, this being due to the exceptional development of the megalopores. The sutural laminæ are much broken away, but the sinus was probably fairly broad and shallow. The insertion plates are quite missing—they have probably broken away. The most striking feature of this shell is the diagonal row of deep pits in the pleural area, and the much elevated broad diagonal rib of the lateral area.

Locality.—Table Cape.

9. Chiton paucipustulosus, *n. sp.* Pl. iv., fig. 2.

One medium valve from Table Cape. A well-preserved specimen.

The *Lateral Area* is slightly raised, and contains a number of wavy transverse sulcations, or growth lines, extending into the pleural area. There are 12 to 14 small pustules on the anterior margin of the lateral area.

Pleural Area.—The growth lines are very distinct in this area, and extend across the jugum. There are about 12 short longitudinal imbricating riblets, those nearest the jugum being the longest, and becoming shorter as they approach the centre of slope, those near the centre being mere elongated lumps. From the centre to the girdle they are absent.

Length of dorsal area, 6 mm. Sinus wide, increasing from 2 to 4 mm. The sutural laminæ are 3 mm. wide near the sinus, gradually lessening towards the girdle. The pectination of the teeth is fairly distinct.

Measurement.—Width, 25 mm.; length of area, 6 mm.; divergence, 105°.

Remarks.—The shell is glossy olive-green, blotched with olivaceous cuneiform dashes.

10. Lepidopleurus, *sp. indet.*

One median valve.

The sculpture in good preservation, although the lateral areas are broken away.

Color.—Creamy white.

Lateral Area.—Raised, ornamented with six regular, radial rows of flattened granules. These are large at the girdle, and gradually diminish towards the jugum.

Pleural Area.—Sculptured with 16 rows of granulose-longitudinal ribs. The interspaces double in width as they approach the anterior margin.

Dorsal Area.—Much worn.

Inside.—The sinus appears to have been wide and shallow. The usual diagonal rib is much raised and rather curved.

Measurement.—The valve is 2 mm. longitudinally, and about 4½ mm. in breadth; divergence, 100°.

11. Ischnochiton, *sp. indet.*

Six median valves from Muddy Creek.

The lateral, pleural, and dorsal areas contain a series of 20 to 30 rows of minute triangular pits, converging towards the apex, and having a confluent tendency.

The sinus is about 5 mm. The side slopes are slightly curved. The dorsal area is decidedly beaked, some of the valves being 7 mm. in length; divergence, 95° to 110°.

Remarks.—It is extremely doubtful whether these specimens are referable to the above genus, but without better material it is impossible to be certain.

12. Chiton, *sp. indet.*

One valve, very much worn.

The lateral area distinctly raised, with three or four deep sulcations.

The dorsal area is 9 mm, and has a decided beak.

Width of valve, 17 mm.; divergence, 95°.

The side slopes are slightly curved outwards.

A strong costa in the articulamentum runs up to the dorsal area.

The contour of this valve approaches that of valve two of *Plaxiphora petholata*, Sby.

Locality.—Muddy Creek.

13. Ischnochiton, *sp. indet.*

One median valve from Muddy Creek.

The areas are indistinctly marked.

The sutural laminæ are half the width of the tegmentum.

Width of valve, 20 mm. The length of the dorsal area is 5 mm.; divergence, 130°.

The generic position of this species is doubtful, but the thinness of the shell and the angle of divergence lead one to conclude that it rightly belongs to the above genus.

14. Chiton, *sp. indet.*

Two median valves from Muddy Creek.

Lateral Area.—Distinctly raised, the anterior margin being the most elevated. Three or more deep concentric growth lines cross the area. A very shallow radial ribbing is distinctly present near the girdle, but it disappears as the jugum is approached.

Pleural Area.—This area is ornamented with imbricating longitudinal ribbing. These ribs are strong near the girdle, but become shallower as they approach the jugum. The jugum is much worn.

Measurement.—Width, 8 mm.; length, 4 mm.; divergence, 80°.

15. Chiton, *sp. indet.*

One specimen anterior valve.

Slope strongly convex.

Shell polished, the only ornamentation being about 20 shallow concentric ridges.

Inside.—The articulamentum is crossed laterally by a strong ridge. The pectination of what remains of the insertion plate is most pronounced.

16. Chiton, *sp. indet.*

One median valve from Muddy Creek.

Lateral Area.—Much broken away, slightly raised, sculptured with strong broken longitudinal ribs.

Pleural Area.—Ornamented with shallow, but distinct longitudinal ribbing, the interspaces being twice the width of the ribs.

Dorsal Area.—Much worn.

Measurement.—Width, 8 mm.; length, 4 mm.; divergence, 95°.

17. Lorica, *sp. indet.*

Two median valves from Muddy Creek, both much worn.

Decidedly carinated, side slopes slightly curved.

The *Lateral Areas* are raised, and contain three or four deeply marked radial sulcations, converging at the apex.

The *Pleural Areas* have from eight to ten deep longitudinal ridges, gradually lessening in width towards the girdle.

The *Dorsal Areas* are too much worn to admit of description.

Length of Dorsal Area.—One valve 11 mm., the other 8 mm.; width, 23 mm. and 20 mm. respectively; divergence, 90° and 95°.

The interior of the large valve has a decided internal costa running transversely, and a folded pleat in the posterior margin. The shell bears a striking relationship to the modern *Lorica volvox* of Reeve.

18. Acanthochiton, *sp. indet.*

One median valve.

Latero-pleural Area covered with triangular elongated, flattened pustules.

The *Lateral Area* is slightly raised.

The insertion plates are large, being more than half the width of the latero-pleural area.

The *Dorsal Area* is broad wedge shape, but very much worn.

Measurement.—Width, 8 mm.; length, 5 mm.; divergence, 130°.

Remarks.—This specimen bears a strong resemblance to *A. crocodilus*, Torr and Ashby.

Locality.—Muddy Creek.

19.

Five valves from Muddy Creek, and one valve from Schnapper Point, all very worn.

ON THE OCCURRENCE OF MIOCENE LIMESTONES AT EDITHBURGH, AND THEIR STRATIGRAPHICAL RELATIONSHIP TO THE EOCENE OF WOOL BAY, WITH DESCRIPTION OF A NEW SPECIES BY PROFESSOR R. TATE.

By HERBERT BASEDOW.

[Read July 2, 1901.]

PLATE III.

As far back as 1885 Professor Ralph Tate recorded and described a few species of fossil mollusca from a sub-crystalline limestone at Edithburgh, but was doubtful of its correct age. He, however, thought it to be Miocene, as the difference between its physical characters and those of an Eocene series a few miles to the north of Edithburgh were marked, as also because of a view adopted in the "Revision of Older Tertiary Mollusca," 1899.

As this limestone has recently been quarried, an increased number of species have been brought to light, consequently it was thought desirable to reinvestigate this fossiliferous bed. I submit more pronounced palæontological and stratigraphical proofs that Miocene beds do occur at Edithburgh.

A quarter-mile north of Edithburgh a deposit of polyzoal limestone, containing such well-known and characteristic Eocene fossils as *Fibularia gregata*, *Scutellina patella*, *Paradoxechinus novus*, is found underlying yellowish compact limestones. Pebbles are to be seen at the base of this compact limestone, and on close examination they were found to consist of fragments of the polyzoal limestone. This clearly demonstrates that the Eocene bed must have been elevated into a land surface, suffered denudation, and, during a later period of subsidence, was covered by the yellowish compact limestone.

A clearer demonstration that such a sequence of changes did occur is to be found in a splendid example of an erosion line between the undoubted Eocene bed and those above it. At this spot the top surface of the Eocene bed has an altitude of 26 feet above sea level. About 200 yards further north the same Eocene bed, still covered by the compact limestone, has a vertical height of only six feet above sea level, and the erosion line exposed on the face of the cliff between the two sections is well marked. This erosion line extends southwards, exposed at intervals along

the face of the cliff; and at a distance of about a quarter to half a mile from the previous sections fossils of a Miocene type were found in the yellow compact bed above the Eocene. The most prominent of these fossils were *Spondylus arenicola* (characteristic of the Miocene of Aldinga), *Pecten antiaustralis*, *P. sub-bifrons*, *P. palmipes*.

At Wool Bay, to the north of Edithburgh, the Eocene is capped directly by beds of travertine, and the cliffs are here about 60 feet high.

Almost immediately southwards, however, a band of clay of a sticky nature when moist, and red in color, makes its appearance. An artificial section gave—

	Feet.
Recent travertine	13
Red-compact clay	15
Polyzoal limestone	—

Travelling southwards, the Eocene becomes more arenaceous and of a finer nature, showing two distinct beds, the lower being a pink, compact, crystalline polyzoal limestone, while the upper is yellow in color and much softer.

The following section was taken about two miles south of Wool Bay:—

Travertine and soil
Variegated arenaceous clay (unfossiliferous)
Oyster band consisting, as at Aldinga, of *Ostrea arenicola*
White limestone
Eocene limestone

The top of the Eocene limestone, greatly eroded, has a mean altitude of about six feet above sea level, and is covered unconformably by the white limestone, which contains fossils characteristic of Miocene beds—*Ostrea arenicola* and *Pecten antiaustralis*, in company with *Tellina*, *Cardita*, *Diastoma*, and *Chione* being abundant.

The variegated arenaceous clay of this section is quite different in physical features from the red sticky clay of the Wool Bay section described above.

Leaving the coast and travelling westwards to a point distant one and a-quarter miles from Edithburgh, a well section indicates the age of the unfossiliferous clay bed of the section taken two miles south of Wool Bay—

	Feet.
Black soil	1
Rubbly limestone (fossiliferous)	10
Variegated arenaceous clay (unfossiliferous)	11
White rubbly limestone (fossiliferous) ...	2
Yellow sandstone (fossiliferous)	2
Hard compact limestone.	

The variegated arenaceous clay is of Miocene age, as it lies between beds of Miocene limestone, the overlying bed containing species of *Pecten antiaustralis* and *P. sub-bifrons*, while the underlying bed contains *P. antiaustralis*, *P. sub-bifrons*, *P. palmipes*, *Ostrea arenicola*, and *Spondylus arenicola*. This clay, moreover, is similar in its physical characteristics to that of the section two miles south of Wool Bay. The clay of the latter section certainly overlies beds of Miocene age, and, judging from this similarity in physical features, the clay of the coast section is also of Miocene age.

The yellow sandstone of this inland well section underlies the white rubbly Miocene limestone and contains the fossils—*Amussium Hochstetteri*, *Fibularia gregata* and other Echinoids, and *Dimya dissimilis*; consequently it is of Eocene age.

The hard compact limestone underlying the yellow sandstone contains only obscure casts of fossils, but among these *Trigonia semi-undulata* can be recognised and is plentiful.

APPENDIX.

List of Fossils from Miocene Limestone about Edithburgh.

(Revised by Professor R. Tate.)

Name of Species.	Other Miocene Occurrences.
Semicassis subgranosa, *Tate*, 1888	—
Diastoma, *spec. nov.*	Hallett's Cove
Campanile triserialis, *spec. nov.*	Hallett's Cove
Voluta, *spec. indet.*	—
Mitra, *spec. indet.*	—
Trochocochlea, *spec.*	—
Kuphus, *spec. indet.*	—
Haliotis, *spec. nov.*	Hallett's Cove
Pecten antiaustralis, *Tate*, 1885	Adelaide, Hallett's Cove, Aldinga Bay (S.A.), Muddy Creek, Gippsland Lakes, Shelford (Victoria)
Pecten sub-bifrons, *Tate*, 1882	Adelaide, Hallett's Cove, Aldinga Bay
Pecten palmipes, *Tate*, 1885	Aldinga Bay
Dosinia Grayii, *Zittel*, 1873	Gippsland Lakes (Vict.), Pareora and Wanganui (New Zealand)
Limopsis Forskali, *Adams*	Gippsland Lakes
Ostrea arenicola, *Tate*, 1885	Adelaide, Aldinga Bay
Spondylus arenicola, *Tate*, 1886	Hallett's Cove, Aldinga Bay

Limatula Jeffreysiana, *Tate*, 1884	Aldinga Bay, River Murray Cliffs (S.A.), Muddy Creek (Vict.)
Glycimeris subradians, *Tate*, (M.S.)	Hallett's Cove
Meretrix sphericula, *spec. nov.* (M.S.)	Aldinga Bay, obscure casts only
Cardium, *spec. nov.*	—
Cardita, *spec. nov.*	—
Tellina Basedowi, *Tate*, spec. nov.	—

Tellina Basedowi, *Tate*, spec. nov.

Plate III.

Shell rotundly-trigonal, solid, nearly equilateral, moderately convex. Ornamented by concentric, erect, short lamellæ—about ten in 5 mm. length in the medio-ventral region—and radial striæ, which are visible only on the partially decorticated surfaces.

Ventral margin subarcuated; dorsal slopes strong, the posterior nearly straight and roughened by the edges of the concentric sulci, dorsal [post ?]-ventral tip angulated, anterior margin-rounded; the posterior fold and flexure very moderate and sub-marginal.

Beaks depressed, obtuse, contiguous; lunule deeply sunken, ligament occupying about one-half its length.

Interior unknown.

By external characters comes near *T. capsoides* and *T. deltoidalis*, differing by more rotund marginal outline.

Dimensions.—Ant.-post, 40 mm.; umbo-vent., 35; sectional diameter, 17.

Locality.—Common in Miocene limestone in the neighborhood of Edithburgh, Yorke Peninsula (*H.B.*).

The type specimen has been deposited in the Museum of the Adelaide University.

[The above description is the last of the numerous contributions of the late Professor Ralph Tate, who has been recognised as having a place among the highest authorities in natural science, and one to whom students of palæontology, especially in Australia, are deeply indebted. It was but a few hours before his much lamented death that the late Professor read the above description to me. This is but another proof of the earnest and sincere devotion to natural research which characterised him even to the last moments of his valuable life.—H. Basedow.]

ABSTRACT OF PROCEEDINGS

OF THE

Royal Society of South Australia

FOR 1900-1901.

ORDINARY MEETING, NOVEMBER 6, 1900.

Prof. RALPH TATE, F.G.S. (Vice-President), in the chair.

EXHIBITS.—Prof. RALPH TATE exhibited a fossil leaf (*Cordia ?*) collected by the Superintendent of the Stockade from a very fine grained calcareous sandstone overlying the quartzites in the quarry. Assigned age is upland Miocene. J. G. O. TEPPER, F.L.S., showed a double-flowered specimen of *Tetratheca ericifolia*, this deviation from normal structure being probably the result of local irritation in the plant itself. A. H. C. ZIETZ, F.L.S., &c., a specimen of *Acanthiza*.

PAPER.—"Description of a New Species of *Acanthiza* from South Australia," by A. H. C. ZIETZ, F.L.S., C.M.Z.S., &c., Assistant-Director of the Museum.

ORDINARY MEETING, DECEMBER 4, 1900.

Prof. E. H. RENNIE, D.Sc. (President), in the chair.

EXHIBITS.—A. H. C. ZIETZ, F.L.S., &c., specimens of *Acanthiza*, with special reference to the new species described in his paper read before the Society at the last ordinary meeting. He considered *A. tenuirostris* to be intermediate between *Geobasileus reguloides* and *A. uropygialis*—smaller than the former, but of the same size as the latter bird, and with similar bill, but to be distinguished from either by entire absence of any bright coloring at the base of the tail feathers. EDWIN ASHBY, specimen of the white superb warbler (*Malurus leuconotus*) from near Nackara, on the east side of the Flinders Range; also a specimen of orange-fronted *Ephthianura* (*E. aurifrons*). J. G. O. TEPPER, F.L.S., curious abnormal specimen of Foxglove (*Digitalis purpurea*) and a specimen of carborundum, produced

in electrical furnace, at very high temperature, from the union of carbon and silicon. WALTER HOWCHIN, F.G.S., specimens of rocks from Yorke's Peninsula and Kangaroo Island.

PAPER —"Suggestions on the Origin of the Salt Lagoons of Southern Yorke's Peninsula," by WALTER HOWCHIN, F.G.S.

BALLOT.—Stirling Smeaton, B.A., C.E., and Chas. F. Johncock as Fellows.

ORDINARY MEETING, APRIL 2, 1901.

Prof. E. H. RENNIE, D.Sc. (President), in the chair.

Mr. HOWCHIN, referring to the great loss which the Empire had suffered since the last meeting of the Society in the death of the Queen, reminded those present that Her Majesty was for many years the Patron of this Society, and proposed that a fitting letter of sympathy and condolence should be prepared and forwarded to His Majesty King Edward VII., through His Excellency Lord Tennyson. Carried.

PAPERS.—"Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species," by Rev. THOS. BLACKBURN, B.A. "Preliminary Notes on the Existence of Glacial Deposits of Cambrian Age in South Australia," by WALTER HOWCHIN, F.G.S. "A South Australian Meteorite," by G. A. GOYDER, Government Analyst and Assayer.

ORDINARY MEETING, MAY 7, 1901.

Prof. E. H. RENNIE, D.Sc. (President), in the chair.

EXHIBITS.—Prof. RALPH TATE, F.G.S., exhibited a *Succinea*, the first land shell from the mammaliferous deposits, Lake Callabonna. WALTER HOWCHIN, F.G.S., photographs of the Cambrian glacial beds recently discovered by him in the valley of the Sturt River. These were taken by Mr. Greenlees, of Plympton. Mr. HOWCHIN also exhibited a very interesting series of photographs taken by Prof. David, F.R.S., of Sydney, when he recently visited Mount Kosciusko, of grooved and striated rocks, terminal moraines, and other features of the Post-Pliocene glaciation of that district. J. G. O. TEPPER, F.L.S., &c., exhibited a sprig of Eucalyptus with a colony of scale insects (*Eriococcus*) which produce the manna found under certain gum-trees.

PAPERS.—"Mode of Motion and Transference of Energy Through Space, more especially of Light and Heat," by J. G. O. TEPPER, F.L.S., &c. "Notes on Glacial Beds of Cambrian Age in Far North of South Australia," by C. CHEWINGS, Ph.D., F.G.S. "Further Notes on Eocene Corals" (Part III.), by J. DENNANT, F.G.S.

ORDINARY MEETING, JUNE 4, 1901.

W. L. CLELAND, M.B. (Vice-President), in the chair.

EXHIBITS. — EDWIN ASHBY, a handsome pair of Grebes (*Podiceps cristatus*) from Victoria. STIRLING SMEATON, B.A., Kurdaitcha native tracking and hunting shoes made of Emu and other feathers and human hair, from Oodnadatta. G. A. GOYDER, a meteorite of considerable size, also a portion ground down and etched, showing crystallization.

BALLOT.—J. A. Haslam, B.Sc., Registrar of School of Mines, Adelaide, as a Fellow. Herbert Basedow and Edith Collison, B.Sc., as associate members.

PAPER.—"Notes on the Extinct Volcanoes of Mounts Gambier and Schank," by WALTER HOWCHIN, F.G.S.

ORDINARY MEETING, JULY 2, 1901.

Prof. E. H. RENNIE, D.Sc. (President), in the chair.

EXHIBITS.—WALTER HOWCHIN, F.G.S., a specimen of pure white crystalline stalagmite from the old drive in Anstey's copper mine, near Highercombe. It has a satin-like lustre, and is in the form of aragonite. The deposit from which this stalagmite was taken varies in thickness up to an inch, and perhaps averages a quarter of an inch, and represents about 55 years' growth —a much more rapid increase than a similar formation in Kent's Cavern, Devonshire, England, which has only increased one-twentieth cf an inch in 200 years. This remarkable difference is due, Mr. HOWCHIN thinks, to the very moist condition of the drive and the great evaporation during the year. Near the mouth of the drive the floor and walls are covered with a thick calcareous tufa, produced by the deposit of carbonate of lime on the growing moss. RICHARD KLEEMAN, a specimen of highly-fossiliferous calcareous rock from Margaret Creek, Far North, probably of Lower Cretaceous age. Tin crystals from South Lake, and asbestos from the North. J. G. O. TEPPER, F.L.S., some galls on Eucalyptus leaves, closely resembling large brown caterpillars. Mr. TEPPER, remarking on the large increase of the gall insect, stated that when a boy he had great difficulty in finding galls, but now since Parrots—whose fondness for these was well known—had been killed or driven away, galls had increased to a very dangerous degree.

PAPER.—"On the Occurrence of Miocene Limestones at Edithburgh, and their Stratigraphical Relationship to the Eocene of Wool Bay," by HERBERT BASEDOW.

ORDINARY MEETING, AUGUST 6, 1901.

Prof. E. H. RENNIE, D.Sc. (President), in the chair.

EXHIBITS.—A. H. C. ZIETZ, F.L.S., &c., clusters of crystals from near Blinman.

PAPER.—"Notes on the Geology of Encounter Bay," by GEOFFREY DUFFIELD, B.Sc. In this paper Mr. Duffield described two exposures of raised beaches, one situated about three-quarters of a mile up the Inman River, in two sections, separated by a quarter of a mile, and reaching a maximum thickness of 16 feet. The other exposure occurs in the railway cutting near the mouth of the Hindmarsh River, at about 20 feet above high-water mark. Several erratics of granite not previously noted were observed at the back of Mr. Cudmore's house. One measured 12 feet by 10 feet. Brown's Hill, situated N.W. of Victor Harbor, is mainly composed of a highly silicious quartzite rock, with a dip of 70° and a strike of 30° W. of S. As the beds extend in a south-westerly direction they become more micaceous, with veins of quartz, but the dip and strike remain unaltered. Rosetta Head is a granite mass intruding into the quartzites and schistose rocks. The junction shows contact metamorphism. On the seaward side of the Head a diorite dyke penetrates the granite, with a strike parallel to the face of the cliff for the depth of a hundred yards. A second granite outcrop is seen on the landward side, separated from the main mass by a belt of quartzite. Granite Island was described as consisting chiefly of granite, but includes two well-defined quartzitic areas within the granite mass, which have been more or less altered by contact with the latter. The granite has also caught up into its flow many isolated fragments of the adjacent beds, which have preserved their sharply angular outlines without apparent alteration.

ANNUAL MEETING, OCTOBER 1, 1901.

Prof. E. H. RENNIE, D.Sc. (President), in the chair.

EXHIBITS.—WALTER HOWCHIN, F.G.S., some specimens of quartzite from near Petersburg, showing striations due to ice action, and a block of graphic granite similarly marked. There being none of the latter rock nearer than Yorke's Peninsula, this piece of rock would seem to indicate the general direction of the ice movement during the Cambrian period.

Annual report and balance-sheet were read and adopted.

ELECTION OF COUNCIL.—President, Prof. Edward H. Rennie, M.A., D.Sc., Lond.; Vice-Presidents, Walter Howchin, F.G.S., W. L. Cleland, M.B.; Honorary Treasurer, Walter Rutt, C.E.; Honorary Secretary, G. G. Mayo, C.E.; Members of Council, Rev. Thos. Blackburn, B.A., Sam. Dixon, W. H. Selway, Edwin Ashby, A. M. Morgan, M.B., Ch.B., and W. B. Poole; Auditor, J. S. Lloyd.

THE PRESIDENTIAL ADDRESS read by the PRESIDENT, upon the motion of W. HOWCHIN, seconded by SAM. DIXON, was ordered to be printed in the Society's "Transactions."

PAPERS.—"Fossil Polyplacophoræ from Eocene Beds of Muddy Creek, Mornington, and Moorabool (Victoria), with Definitions of Ten New Species, and Notes on others," by EDWIN ASHBY and W. G. TORR, LL.D. "Further Notes on Australian Coleoptera, with description of New Genera and Species," by Rev. THOS. BLACKBURN, B.A. "Description of New Genera and Species of Australian Lepidoptera," by OSWALD LOWER, F. Ent. S. Lond. "List of some Western Australian Birds, with Notes made during a short visit to Western Australia," by EDWIN ASHBY.

Proposed by WALTER HOWCHIN, F.G.S., seconded by W. L. CLELAND, M.B., and carried—"That this meeting place on record the very great loss the Royal Society of South Australia, as well as the scientific community of Australia in general, has suffered by the death of Professor Ralph Tate. Prof. Tate took a leading part in the foundation of this Society, and has enriched its publications with numerous and very valuable contributions on Australian Geology, Palæontology, and Botany. It is a matter of deep regret to this Society that he has not lived to complete his great work in elucidation of the mollusca of the Australian Tertiaries, and that whilst still in the vigor of life the Society should be bereft of his ripe experience in its councils and his extensive knowledge of scientific matters, which added so much to the interest of its meetings. This meeting extends its most sincere sympathy to his widow and family in their severe bereavement."

Moved by EDWIN ASHBY, seconded by A. H. C. ZIETZ, F.L.S., and carried—"That in the opinion of this Society the typical geological, botanical, and conchological collections of the late Professor Ralph Tate should be preserved to this State, and that the Council of this Society be requested to take all necessary steps to this end."

ANNUAL REPORT.

OCTOBER 1, 1901.

The Council report that the interest in scientific research has been fairly maintained during the year. The following papers have been laid before the Society :—

"Description of a New *Acanthiza* from South Australia," by A. H. C. Zeitz, F.L.S.

"Mode of Motion and Transference of Energy through Space, more especially of Light and Heat," by J. G. O. Tepper, F.L.S.

"Suggestions on the Origin of the Salt Lagoons of Southern Yorke's Peninsula;" "Preliminary Note on the Existence of Glacial Beds of Cambrian Age in South Australia"; "Notes on the Extinct Volcanoes of Mount Gambier and Mount Schank, South Australia," by Walter Howchin, F.G.S.

"Notes on Glacial Beds of Cambrian Age in Far North of South Australia," by C. Chewings, Ph.D., F.G.S.

"A South Australian Meteorite," by G. A. Goyder, F.C.S., Gov. Analyst.

"Descriptions of New Species of Corals from Australian Tertiaries," by J. Dennant, F.G.S.

"Notes on Australian Coleoptera," by Rev. Thos. Blackburn, B.A.

"On the Occurrence of Miocene Limestones at Edithburgh and their Stratigraphical Relationship to the Eocene of Wool Bay," by Herbert Basedow.

"Notes on the Geology of Encounter Bay," by Geoffrey Duffield, B.Sc.

"Fossil Polyplacophoræ from Eocene Beds of Muddy Creek, Mornington and Moorabool, Victoria, with definitions of ten new Species and Notes on others," by Edwin Ashby and W. G. Torr, L.L.D.

"Description of New Genera and Species of Australian Lepidoptera," by Oswald Lower, F. Ent. S. Lond.

"List of some Western Australian Birds, with notes made during a short visit to Western Australia," by Edwin Ashby.

During the year many objects of scientific interest have been exhibited by Fellows and members.

The membership of the Society consists of 11 Honorary Fellows, 65 Fellows, 7 Corresponding members, and 2 Associates.

The late appearance of Vol. XXV., Part I., was largely due to the failing health of the Editor, the late Prof. Ralph Tate, whose recent death leaves a blank that will not be readily filled.

The Memoirs will not appear this year owing to the absence of Prof. Stirling from the State.

The Malacological Section, which had for some time been inactive, has now resumed work. The Astronomical Section has ceased to exist, while the Field Naturalist Section continues its useful investigations.

Mr. Howchin's great discovery of glaciation amongst the Cambrian rocks in the Sturt River Valley and in the North (near Petersburg) must have a very important bearing, not only upon geological science generally, but particularly upon that of Australia.

The Rev. Thos. Blackburn, who continues to add to our knowledge of the Coleoptera of this State by discovery and classification, has been enabled to identify various species through having certain type specimens of Tasmanian Coleoptera entrusted to him for examination by Prof. Kolbe, of the Royal Museum, Berlin.

Donations by scientific bodies from all parts of the world, especially America, have so largely increased of late years that the possibility of making the vast amount of interesting and valuable matter therein contained readily available to the Fellows and members has become a very urgent question. The first step towards doing this has been the preparation of a card catalogue, which was completed during the year. This catalogue brought to light many breaks and irregularities in the serial literature, but has accomplished little in making the library really useful to the members.

An address from this Society of condolence on the death of our beloved Queen was forwarded through His Excellency the Governor to His Majesty King Edward VII. and the Royal Family; and an address of welcome, suitably illuminated, was presented by the President to their Royal Highnesses the Duke and Duchess of Cornwall and York upon their arrival in the State.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Dr.	£	s.	d.	£	s.	d.
October 1, 1900.						
To Balance				143	2	0
" Subscriptions—						
Royal Society	55	12	6			
Field Naturalists' Section	15	0	0			
Malacological Section	1	19	0			
				72	11	6
" Government Grants—						
Ordinary	59	1	1			
Illustrating "Fossil Fauna of South Australia"	100	0	0			
				159	1	1
" Interest				5	5	2
" Sale of Memoirs				6	1	5
				£386	1	2

Cr.	£	s.	d.	£	s.	d.
By Cost of Transactions—						
Printing...	66	14	4			
Illustrating	13	5	6			
Publishing	14	2	0			
				94	1	10
" Wages—Caretaker				3	0	0
" Printing, Postage, and Stationery ...				7	3	10
" Library—						
Binding	2	17	0			
Catalogue	8	8	0			
				11	5	0
" Grants-in-aid—						
Field Naturalists' Section	10	0	0			
Malacological Section	1	0	0			
				11	0	0
" Address to Duke of Cornwall... ...				15	15	0
" Advertising				2	7	0
" Exchange on Cheques				0	1	6
" Balance in Savings Bank, October 1, 1901				241	7	0
				£386	1	2

Audited and found correct,

J. S. LLOYD, F.I.A., S.A., Auditor.

WALTER RUTT, Hon. Treasurer.

PRESIDENTIAL ADDRESS.

By Professor E. H. Rennie, M.A., D.Sc.

[Read October 1, 1901.]

At the close of another year we, as Fellows of the Royal Society of South Australia, have cause both for regret and satisfaction. We must all feel a sense of loss this evening, meeting as we do without one distinguished member who for many years worked enthusiastically in the interests of this Society. Professor Tate was an almost constant attendant at our meetings till illness prevented him, and he contributed very largely to their success by the original and interesting matters he brought forward. For a long time he edited carefully our "Proceedings," which contain a long record of his own patient and laborious work in that department of palæontology with which he was specially familiar, work which has been recognised far beyond the limits of this State as of great and permanent value to the scientific world. The Society and the State is much the poorer by his removal from amongst us, and for a long time to come the blank caused by his death will be felt by us at our meetings here.

On the other hand, we have cause for satisfaction, because work of more than usual importance has been accomplished during the year. I refer, of course, more particularly to the discoveries recently made by Mr. Howchin, and confirmed in all respects by Professor David and Mr. Pittman. The details we hope to hear from Mr. Howchin himself at a later date, but in the meantime we congratulate him heartily upon a discovery which is of so much interest and importance. Apart from this special discovery, our "Proceedings" contain the records of solid work done in various departments of science, a record of which we have no reason to be ashamed.

In casting about for a subject on which to address you, it occurred to me that, at what I might venture to call a critical period in the agricultural history of this State, it would be of some interest to give some account of scientific development in connection with agriculture generally, and with special reference to the requirements of this State, and, with that as a text, to refer to other subjects in which there is a crying need for accurate scientific investigation, such investigation being necessary, not merely to elucidate scientific theories, but to improve our material condition.

Commencing then with matters agricultural, or rather agriculturally chemical, it has become apparent in recent years that many old ideas must be discarded. The vague notion that it is only necessary to supply to the soil in any fashion the chemical constituents which go to make up the plant has been of necessity abandoned, and it has been found that almost as much care and attention must be bestowed on feeding plants as on feeding animals, not only with respect to the nature of the food supplied, but also with reference to the manner of its administration and the conditions under which the food becomes assimilable.

Every schoolboy knows that nitrogen must be supplied to plants, but nothing has caused more discussion and given rise to more experiments than the questions whence and how plants obtain their supply of this substance. It has been known from time immemorial that such substances as stable manure, sewage, &c., which when exposed to air decompose, and give off ammonia, are capable when added to the soil of yielding a supply of nitrogen to plants, but till comparatively recently it was not known by what series of processes the nitrogen is made available for use. It became known, however, that all fertile soils contain nitrates, and further, that nitrates are formed in soil under certain conditions, from such substances as I have already referred to, stable manure, sewage, &c. With these data as a starting point investigations were undertaken, which led to remarkable and interesting results. In a paper published in the journal of the Chemical Society of London for 1891, Warington, who was associated as chemist with Gilbert and Lawes, in their world-famed experiments at Rothamstad, in England, summarises the results of experiments carried out chiefly by himself, the principal of which are these :—

1. There are present in fertile soils minute organisms of a bacterial nature, which convert ammonia into nitrates. 2. These organisms are ærobic, and are not found at depths greater than about 6 ft., or perhaps less. 3. The ammonia is first converted into nitrates by a special organism (nitrosomonas), which, however, is incapable of converting nitrites into nitrates, or of directly converting ammonia into nitrates. 4. The growth of this organism, and therefore its activity, is promoted by the presence of carbonic acid, sodium bi-carbonate, and some other substances containing carbon, the carbon being apparently necessary to provide for its growth and multiplication. Ordinary sodium carbonate, however, greatly hinders the action of this organism. 5. There is another organism in fertile soil (nitrobacter), which is capable of energetically converting nitrites into nitrates, but is not capable of directly converting ammonia into nitrites or nitrates. 6. The growth of this organism is also, as

in the case of nitrosomonas, promoted by the addition of a moderate quantity of sodium bi-carbonate, but is hindered by sodium carbonate. It is also hindered by a large amount of ammonia. Hence, if a large amount of ammonia is present it must first be converted almost entirely into nitrites before nitrates can be formed.

The importance of these results is obvious. They place at once upon a sound scientific basis the practice of adding manures containing ammonia, nitrites or nitrates, the ultimate product being always nitrates, provided that the conditions necessary for the life of the working organisms are present. But these results also tell us that there may be conditions, such as, for instance, the absence of either or both of the organisms, or the presence of sodium carbonate, which will either entirely stop or, to a great extent, hinder these necessary processes. Under such conditions, plant life will not flourish.

Recent investigations show, too, that water may play a more important part than has been generally supposed. It is a recognised fact that nitrification takes place more readily in light soils than in strong ones, and this is generally attributed to the more easy penetration of air into the former, air being necessary for the life and work of the bacteria. Schloesing, in a paper published in the "Comptes Rendus" (vol. 125), points out that in strong soils, the particles of which are extremely fine, the thickness of the layer of water surrounding each particle is less than the thickness of that surrounding each particle in a light soil (containing the same amount of water), the particles of which are larger, because the total surface in the former case is greater than in the latter. In a series of experiments he showed that by slightly increasing the quantity of water soils in which nitrification took place imperfectly became immensely improved in that respect, nitrification taking place completely. He draws the conclusion that the action of the organism is in some way connected with the thickness of the layer of water surrounding the particles of the soil, but it is impossible in the small space of an address such as this to explain his reasoning fully.

Warington, in his researches, found that the bacteria to which reference has been made would not grow on gelatine or agar-agar; in other words, such nitrogenous substances as these are not affected by these organisms, and therefore such substances are not directly available for plant food. But it has lately been shown that if along with the nitrifying bacteria another is added which is capable of breaking up the gelatine or agar-agar with formation of ammonia, then the former grow and flourish, and these substances then break down completely, and yield their nitrogen ultimately in the form of nitrates; *i.e.*, in the form suit-

able for plant food. Thus three distinct organisms are necessary to make the nitrogen of complex nitrogenous substances available for plants. This association of various organisms in bringing about important results I shall refer to later; it is one of the most interesting phenomena which modern science has revealed.

Now these various organisms may be deficient in soils in particular cases, and attempts have been made to supply them artificially. For this purpose the bacteria have been cultivated in certain media, and sold under the name of "nitragin." Experiments have been made with this material in Germany and elsewhere, but with very variable results. In some cases great benefit is said to have resulted, in others little or none. More experiments are required before any definite conclusions can be drawn. It is obvious that such a material might fail owing to improper preparation, or that it might appear to fail, not from any want of virtue in itself, but because the soil to which it is added already contains the organisms in sufficient numbers, their activity perhaps being hindered by unfavorable conditions. But there are many other organisms present in soil besides those already referred to, and among these are usually to be found some which have a directly opposite effect, that is, they break up nitrates into nitrites, or may go still further, and destroy them altogether, with liberation and consequent loss of free nitrogen. They are hence known as denitrifying bacteria. Obviously great complexity is here introduced, and the question has to be considered whether these denitrifying organisms can cause serious loss of nitrogen from the soil, and if so under what conditions. It is practically agreed that in some cases excessive quantities of fresh horse or cattle manure exercise an injurious rather than a beneficial effect, and especially that they lessen the effect of nitrogenous manures, such as sulphate of ammonia and nitrate of soda, and it has further been shown that manure of this kind frequently contains these denitrifying bacteria in large numbers. The conclusion was drawn, apparently too hastily, that it is the presence of numbers of these organisms in the excreta of horses and cattle which causes the deleterious effect. Recent investigations, however, have thrown considerable doubt on this conclusion. It has been shown that the denitrifying bacteria are already present, at least usually, in the soil, and it is asserted that the mere addition of a larger number will not account for the phenomena. A large number of experiments have been made to elucidate this question, the results of which have been to show that certain substances—starch, for instance—greatly increase the activity of these bacteria, doubtless because they are particularly suited for food for the organisms, and it has been asserted that some of these food substances are always present in the

straw mixed with the manure, and therefore exercise their stimulating effect. This view, however, is controverted by others, who hold that the stable manure acts simply by interfering in some way with the activity of the nitrifying organisms, and that in actual practice there is no appreciable loss of nitrogen, even although in experiments on the small scale in the laboratory such loss of nitrogen has been proved to occur. These different opinions are not altogether inconsistent with one another, and they may all be in a measure true, but much patient and difficult investigation is yet required.

The question still remains whether plants are able to obtain a supply of nitrogen from any other source than nitrogenous compounds contained in or supplied to the soil. Can they utilise the vast stores of free nitrogen contained in the atmosphere? The answer is not simple, and controversy on this point has raged for many years, and is still raging. It has been proved that some plants can assimilate nitrogen and grow, even although they be planted in soils absolutely free from nitrogen. These are leguminous plants, and certain lower algæ—perhaps mixed with bacteria. But this assimilation or fixation of nitrogen takes place, in the case of leguminous plants at any rate, only under fixed conditions. They must be "infected" with certain organisms (provisionally termed bacteroids, because their nature is uncertain), and unless these bacteroids are present the plants will not grow in the absence of nitrogenous matter in the soil. It is well known that connected with the roots of leguminous plants there are almost always to be found small nodules, like galls in general appearance. When these are examined microscopically they are found to contain enormous numbers of these bacteroids, which can be grown in ordinary media, such as gelatine, and behave in many respects like bacteria. In any soil, containing the other necessary constituents of plant food, but devoid of nitrogen, leguminous plants will grow provided these organisms be added. Experiments have been conducted in such a way as to show that the nitrogen taken up by the plants in these cases can only come from the free nitrogen of the air. But this being granted, the important question is where and how is this nitrogen fixed? There are several possibilities, all of which are ably discussed by Professor H. Marshall Ward in an article published in "Nature" in 1894.

1. The gaseous nitrogen might be directly fixed by the plant, that is absorbed by the cells and converted into the complex nitrogenous constituents of the plant, just as carbon dioxide is absorbed and goes to build up the plant tissues. The weight of evidence, however, is against this view. It is apparently true, as already stated, that certain lower algæ "fix" nitrogen in soils

devoid of nitrogen, but it is doubtful whether they do this without the aid of other lower organisms. In fact, it is stated in one of the most recent papers on the subject by some German scientists that experiments made with certain specified algæ prove that these plants do not fix nitrogen except by the aid of certain bacteria, and that this is probably true in all cases. In this connection it may be stated that Berthelot claims to have proved that certain bacteria can fix nitrogen, and so enrich the soil in nitrogen compounds.

2. This leads to the second view that nitrogen is fixed in the soil by means of bacteria, bacteroids, &c., and is by them converted in the soil into some kind of nitrogenous matter, which is then absorbed by green plants in the ordinary way.

3. A third view is, to quote Professor Ward's own words, that "the fixation of the atmospheric nitrogen can be conceived of as a powerful act of the machinery of the leguminous plant, urged to the necessary expenditure of energy by the stimulating action of the organism in its roots." An opinion as to the correctness of this view might perhaps be arrived at easily if we could determine where the nitrogen is absorbed; that is, whether by the leaves and stems or by the roots. If by the leaves and stems, then the hypothesis just quoted would seem to be a very probable one. This is a matter extremely difficult to deal with experimentally. Professor Ward points out, however, that microscopic examination of the nodules on the roots of leguminous plants indicates, by various signs, that they are the seat of intense physiological activity, and that therefore in all probability they are the seat of the fixation of nitrogen.

4. The fourth and last theory is that the root organisms act merely as accumulators of nitrogenous material which has been fixed in the soil by their means, and that the leguminous plant benefits by "devouring" the bacteroids eventually, and profiting by their stores of nitrogenous material. In this case the bacteroids may be really more parasitic than is represented by the third view of their functions; that is, they may use the root to supply themselves with nutriment, and then by their vital processes to store up nitrogen.

It it evident that a vast amount of careful and difficult experimental work is necessary to decide this question, a question which, however, to use Professor Ward's words, "promises to be of more importance to agriculture in the future than any legislation as to prices, &c., that we can conceive; for if it turns out that the acquisition of free nitrogen by the land, or what is the same thing, the plants growing on it, can

be economically promoted, the farmer and forester may have the control of sources of real wealth not yet dreamt of."

It follows from what has been said, that if leguminous plants, such as peas, are planted as a crop, they will absorb nitrogen from the air and store it up partly in their leaves, partly in their roots. If, therefore, peas are grown as a crop they should increase the total nitrogen in the soil, especially if they be all ploughed in. This has been found to be the case, hence the use of peas for this purpose.

You will not have failed to notice in what has been said the association of organisms in bringing about certain results. This phenomenon, under the name of symbiosis, is attracting great attention in the scientific world, and is proving to be of far-reaching importance. In its widest sense the term may be applied to almost any association of living beings whereby important results are brought about; for instance, the association of the plague bacillus with rats, the bacillus of malarial fever with mosquitos, &c. In the narrower sense, however, the term is used of the co-operation of two or more associated organisms for their mutual benefit. Professor Marshall Ward, in a paper read before the British Association in 1899, brings out the salient points in recent results on this subject, and to this paper I am chiefly indebted for the facts to be brought under your notice.

Several instances are now known in which different kinds of bacteria can, when associated, complete processes which no one kind can complete by itself; witness, for instance, the process of nitrification already referred to. Another remarkable instance is quoted by Winogradsky, who has shown that an anærobic bacterium, *Clostridium pasteurianum*, is able, if supplied with sufficient glucose, and protected from oxygen, to fix atmospheric nitrogen. Now such conditions are not easy to bring about artificially, but when *Clostridium pasteurianum* is active, it is found to be always working in the meshes of a network of ærobic, that is, of oxygen consuming bacteria, the latter rendering possible the activity of the former. Similar phenomena have been observed with fungi. The Japanese drink, saki, or rice wine, is made by infecting the steamed rice with a fungus known as *Aspergillus oryzæ*. This converts the rice starch into sugar, which then undergoes fermentation by the influence of a variety of yeast fungus. So closely is this yeast associated with the *Aspergillus* that for some time a controversy existed as to whether the former was not really a part of the life history of the latter. It is now recognised, however, that we have here a striking case of symbiosis.

Every gardener is aware that whereas certain plants, roses, for example, can be transplanted without difficulty, others are

extremely difficult to transplant. It has been shown that in cases of the latter kind—the ericas, for example—there are intimately associated with the roots of the plant fungi, without which the plant will not grow. Unless the greatest care is taken to carry with the plant, in the act of transplanting, a sufficient quantity of the associated fungus in a living condition the operation is a failure. In some cases it appears that a plant can make use of other but similar fungi to those to which it is ordinarily accustomed. This seems to apply to some forest trees, and in that case transplantation can be accomplished without so much difficulty, provided that the necessary fungus is to be found in the soil to which the tree is transplanted.

In what way these organisms help one another is not easy to decide. It may be that in many cases, as already suggested with the leguminosæ, the lower organism in some way stimulates the higher, perhaps by producing substances which act as stimulants, for it has been shown that certain organic and inorganic poisons can act as plant stimulants if administered in suitable doses, although they may be fatal in large quantities. Or it may be that of two organisms, A and B, B may use up and destroy some substances produced by A, which, if allowed to accumulate beyond a certain limit, would destroy the activity of A. Many cases are known in which an organism produces by its activity a substance which either destroys or greatly hinders its own growth. For example, yeast produces alcohol from sugar, but yeast ceases to act if too much alcohol is present. Whatever be the explanation it is becoming increasingly evident that we are here dealing with a far-reaching principle of nature.

Now, the question naturally arises whether any light is thrown by all this upon results in this country, or whether the investigation of the phenomena to which I directed your attention is likely to be of any importance in connection with the future development of agriculture in South Australia. Reply might be made that if in the opinion of eminent authorities the pursuit of such investigations is likely to be of the highest importance to agriculture generally then as a matter of course they will be of importance here. But certain results have been obtained in this State which deserve special attention. Professor Lowrie has shown as the result of experiments at Roseworthy that nitrogenous manures when added to phosphatic manures in that and similar districts do not produce anything like so much additional effect as they do in Europe, though in some experiments at Millicent he informs us that he got a much greater effect. He states that very probably the difference between the two cases may be due to the fact that in Europe (and this applies also to Millicent in comparison with Roseworthy) with a

heavier rainfall and greater sub-drainage, nitrates are washed out of the soil much more rapidly, and that it therefore becomes rapidly comparatively poor in nitrates, and responds more vigorously to a dose of nitrogenous manure. But it still remains to be explained how it comes about that at Roseworthy, after taking off the land good crops of wheat, &c., which must necessarily remove quantities of nitrogen from the soil, it is still possible, without the addition of nitrogenous manure, to obtain further good crops of a similar kind. Is there such a superabundance of nitrates or other nitrogen compounds in the soil as to be practically inexhaustible for a long period of time, or is there some process, and if so what, by which the stock of nitrogen is replenished? I am not aware whether any data are available as to the total nitrogen supply, but it is improbable that there is any excessive quantity. Whence then does the nitrogen come?

The answer is, according to Professor Lowrie, that it comes during the fallowing process, and probably owing to the influence of minute organisms of some kind, which operate during the process. Observers in other countries have more than once noticed the occurrence on the surface of the soil of minute algæ, such as have already been referred to, and which, you will remember, have been proved to have the power of fixing nitrogen from the air, though probably they effect this only in association with bacteria. Professor Lowrie informs me that he has a strong suspicion that in this country something similar occurs, from appearances which he himself has frequently noticed on the soil. If that be so, the operation of fallowing becomes one of immense importance, and one to the proper carrying out of which great attention should be given. Clearly that involves a careful series of investigations as to the best time and the best manner of carrying it out. It is not known at present, certainly not in this country, under what conditions of moisture, temperature, and physical condition of the soil these organisms do their best work. It may be stated with confidence, therefore, that a series of careful systematic observations are necessary, involving extensive chemical and biological experiments, to decide upon the best method of fallowing, but at present no satisfactory provision is made for such work.

I have dwelt at some length on the supply of nitrogen to plants because it is a question of more general scientific interest than others, such as the supply of phosphates, potash, &c. It must not be supposed, however, that everything is known about these other questions. You are aware that in recent years superphosphate has been used in larger quantities in preference to other forms of calcium phosphate, such as bonedust, &c. In the manu-

facture of superphosphate the phosphoric acid is converted into a soluble form. Yet it does not by any means follow that it is absorbed by the plant in this form. In fact, it is recognised that in certain "sour" soils, deficient in lime, superphosphates may not only do no good, but may do harm. In ordinary soils containing a due proportion of lime, the soluble superphosphate is readily and thoroughly distributed through the soil by rain, but that being so distributed it at once gets neutralised by the lime and converted again into a less soluble phosphate. Even though thus changed, however, into a less soluble form, it is more readily available for the plant than if administered as bonedust, because it has become so thoroughly distributed that all the fine root hairs get ready access to it. It may be also that, although in a less soluble form than the original superphosphate, it is yet in a more soluble form than in bonedust; but that is a point not easy to decide. There are other questions about the use of phosphates, such as the conditions under which bonedust becomes the proper manure to use, upon which I have no time to dwell. As to the function of the phosphates, it has been pointed out by Professor Lowrie, in an address read before the Australasian Association for the Advancement of Science at its last meeting, but not yet published, that they not only supply the phosphorus necessary for the plant, but that they act indirectly in several important ways. They encourage the vigorous action of the soil ferments, they hasten maturity, and they enable cereals to build up tissues and develop grain with less transpiration of water. The importance of the latter effect in a country subject to droughts as this is, you will readily understand. It is well known that, acting upon these principles, Professor Lowrie has persistently advocated the use of superphosphates in this State, having himself proved experimentally that a liberal application of this manure always leads, other things being equal, to a largely increased yield, and his persistence has been justified by the result.

I understand that Sir John Quick has tabled a motion in the Federal Parliament in which it is proposed to establish a central institution such as that in Washington, in which systematic chemical, biological, and other investigations bearing on agriculture can be effectively carried out. These are indications of a move in the right direction. It is absurd to expect that any one man can do efficiently all the things which the principal of the Agricultural College has been expected to do in this State. One man cannot be principal of the college, take part in the teaching, travel round the country giving lectures and addresses, manage the farm on economical lines, and at the same time carry on scientific experiments, that is to say, he cannot do all these things as they

ought to be done, and as he would like to do them, if he be a man with his heart in his work. Let us by all means have a fully-equipped Agricultural College (and I may say here that I deeply regret to hear that it is proposed to reduce the salary which has hitherto been offered to the principal of Roseworthy College), but in addition to that, we want a thoroughly trained scientific staff to deal with the problems which face the agriculturist. Such a staff is at present maintained by the New South Wales Government, and one only needs to glance through the pages of the New South Wales "Agricultural Gazette" to see what magnificent work is being done there. But the conditions as to climate and soil which exist in New South Wales do not exist here, and if the resources of this State are to be developed to their utmost extent, we must have similar work done here.

Can anyone doubt that had there been a trained scientific staff to report on the conditions which would be likely to prevail at Renmark many failures and the loss of much money, with its consequent distress, would have been prevented? Professor Lowrie in his report on the condition of things at Renmark is, as becomes a Scotchman, sufficiently cautious, but it is perfectly obvious that, although with the data at present at our disposal, all failures are not explained, yet a very large percentage of them were due partly to a deficiency of nitrogen and phosphates in the soil, and partly to the deleterious action of the alkaline residues left by the evaporation of the irrigation water upon the roots of the trees. Had a thorough examination been made beforehand the experiments would either never have been made or would have been made under totally different conditions as to drainage and the supply of manure to the soil.

Besides the more purely chemical and biological questions to which I have given prominence, there are others of equal importance which need attention. Entomology, the original pathology of plant diseases, the diseases of wine, the relation of birds to insect life, and rural engineering are all urgently claiming attention. Some of you will remember a matter brought under the notice of the Society by Mr. Tepper a short time ago. He stated that in his boyhood galls were exceedingly scarce on our wattles and forest trees, whereas now it is a matter of difficulty to find a tree unaffected. He said, moreover, that he had found that parrots in captivity were exceedingly fond of these galls, presumably for the insects they contain, and he drew the conclusion that the destruction and driving away of the parrots is responsible for the enormous increase of the galls. Possibly the evidence is not sufficient to establish the correctness of his deduction, but at any rate the fact is beyond dispute that the wattles and forest trees are becoming largely affected, and it is

not too great a stretch of the imagination to suppose that at no very distant date our wattle bark industry may be seriously affected by a stunted condition of the trees, due to a large increase of galls. Whether Mr. Tepper's explanation is the correct one or not, matters not for my purpose. I have used it as an illustration for the desirability, I might say the necessity, for careful observation of the habits of our native birds in relation to insect life. If we knew more about these we should be in a much better position to advise remedial measures for insect pests with some hope of success.

Before concluding I should like to draw your attention to another matter totally unconnected with agriculture, in which I take some personal interest, and which is also of great importance to the material prosperity of Australia. I refer to the fisheries question. There can be no doubt that in many places fish are much scarcer than they used to be. Are there any remedies? I venture to say, yes. In the first place the habits of the various fish need to be carefully studied by trained observers, and that is the only way to obtain reliable information. Commissions of untrained men, however qualified they may be in other respects, who travel from place to place, and examine a few fishermen here and there, will never do any real good. In an article in the "Contemporary" for July of this year, under the name of Mathias Dunn, the writer refers to the enormous numbers of eggs laid by a mature fish, and to a belief which exists in some minds that only a small proportion of these eggs are ever hatched out. He says that by actual observation in some cases, he has proved that the vast majority of the eggs do hatch out (and it is reasonable to suppose that this is true in other cases) but that enormous numbers are destroyed while in a young and helpless condition. He instances the case of the turbot, which lays from two to twelve millions of eggs, according to the maturity of the parent. These fish leave the deep sea and spawn from three to five miles from the shore. The young fish make their way to the surface of the water to within about 100 yards of the shore, where they spend the first twelve months of their life. The mortality in passing over this narrow strip of sea is tremendous. They are attacked by birds from above and fish from below, and but a small proportion ever reach their destination. During a recent visit to Encounter Bay I was informed by the fishermen that a short time ago, when the barracoota were abundant on the coast, they had observed enormous numbers of minute fish (of what kind they did not know) near the surface of the water. They were being devoured in myriads both by gulls and barracoota, the latter being full of them. Something, therefore,

similar to what is described by the author of the article referred to seems to take place on our own coasts. Now, what is being done in America? Chad on the Pacific coast and cod on the Atlantic coasts are being hatched out in places in which the young fish are specially protected from destruction, and in which they are kept till able to look after themselves. Then they are turned out into the ocean. The result is an enormous increase of these fish in the places named, an immense supply of chad having become available, and a profitable cod fishery having been established in places where cod have never previously been found within the memory of man. The author also draws attention to the necessity for preserving estuaries of all kinds as natural spawning places, and for protecting the fish in such localities from indiscriminate destruction by nets. It has already been found necessary in some places in this State to place restrictions on net-fishing, and I am convinced that such restrictions should be extended to all places, such as, for instance, the Port River, which may be regarded as natural spawning places, and as suitable for the growth and protection of young fish. Necessarily such measures would cause temporary hardship to some fishermen, but that can scarcely be considered a serious objection in view of the serious issues involved.

It is obvious that one might include in an address such as this subjects of equal if not greater importance than those which I have briefly alluded to, such as, for example, the diseases of stock, and, in fact, the whole range of sanitary science; but I think I have said enough to indicate the value of scientific enquiry as a means of advancing the material wealth of the country. Its importance, in my opinion, can scarcely be over-estimated. I am not pleading here, be it understood, for the pursuit of science for science sake, though it could be shown by many examples that such a pursuit has led over and over again to results of inestimable value; I am pleading for scientific investigation which will inevitably yield almost immediately results of great practical value, and the sooner its importance is recognised the better will it be for South Australia.

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LIST OF FELLOWS, MEMBERS, &c.

NOVEMBER, 1901.

Those marked (F) were present at the first meeting when the Society was founded. Those marked (L) are Life Fellows. Those marked with an asterisk have contributed papers published in the Society's Transactions.

Any changes in the addresses should be notified to the Secretary.

Date of Election.

HONORARY FELLOWS.

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1897. *DAVID, T. W. EDGEWORTH, B.A., F.R.S., F.G.S., Prof. of Geology, Sydney University.
1888. *DENNANT, JOHN, F.G.S., F.C.S., Inspector of Schools, Camberwell, Victoria.
1876. ELLERY, R. L. J., F.R.S., F.R.A.S., Government Astronomer, The Observatory, Melbourne, Victoria.
1890. *ETHERIDGE, ROBERT, Director of the Australian Museum of New South Wales, Sydney.
1893. GREGORIO, MARQUIS DE, Palermo, Sicily.
1855. HULL, H. M., Hobart, Tasmania.
1892. *MAIDEN, J. H., F.L.S., F.C.S., Director Botanic Gardens, Sydney, N.S. Wales.
1899. *Meyrick, E. T., B.A., Ramsbury, Hungerford, Wiltshire, England.
1876. RUSSELL, H. C., B.A., F.R.S., F.R.A.S., Government Astronomer, Sydney, N.S. Wales.
1894. *WILSON, J. T., M.D., Prof. of Anatomy, Sydney University.

CORRESPONDING MEMBERS.

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1880. *FOELSCHE, PAUL, Inspector of Police, Palmerston, Northern Territory, Australia.
1893. *McKILLOP, Rev. DAVID, Daley River Mission, N.T., Australia.
1886. NICOLAY, Rev. C. G., Fremantle, Western Australia.
1883. *STIRLING, JAS., Government Geologist, Victoria.
1893. *STRETTON, W. G., Palmerston, N.T., Australia.

FELLOWS.

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1883. *BROWN, H. Y. L., F.G.S., Government Geologist, S.A.
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1899. BROWNE, T. L., Adelaide, S.A.
1898. *BROWNE, J. HARRIS, North Adelaide.

1893. BRUMMITT, ROBERT, M.R.C.S., Gilberton.
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1895. CLELAND, JOHN B., M.B., Ch.B, Pathologist Prince Alfred's Hospital, Sydney, N.S.W.
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1895. COOKE, JOHN H., Adelaide, S.A.
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1893. DUDLEY, URIAH, White Rock S.M., Drake, N.S.W.
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1899. FERGUSSON, ANDREW, Agricultural School, Adelaide.
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1887. GRASBY, W. C., F.L.S., Adelaide, S.A.
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1891. *HOLTZE, MAURICE, F.L.S., Director Botanic Gardens, Adelaide, S.A.
1883. *HOWCHIN, WALTER, F.G.S., Lecturer on Geology, The University, Adelaide.
1901. HASLAM, J. A., B.Sc., Registrar of the School of Mines and Industries, Adelaide.
1893. JAMES, THOMAS, M.R.C.S., Moonta, S.A.
1900. JOHNCOOK, CHAS. F., Wilmington, S.A.
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1899. KLEEMAN, RICHARD, University, Adelaide, S.A.
1899. *KOCH, MAX, Port Pirie, S.A.
1884. LENDON, A. A., M.D., Lond., M.R.C.S., Lecturer on Forensic Medicine and on Chemical Medicine, University of Adelaide; Honorary Physician Children's Hospital, Adelaide, S.A.
1856. LLOYD, J. S., Adelaide, S.A.
1897. *LEA, A. M., Government Entomologist, Hobart, Tasmania.
1888. *LOWER, O. B., F.Ent.S. Lond., Broken Hill, N.S. Wales.
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1885. *RENNIE, EDWARD H., M.A., D.Sc., London, F.C.S., Professor of Chemistry University of Adelaide, S.A.
1869. *RUTT, WALTER, Chief Assistant Engineer, Adelaide, S.A.
1891. SELWAY, W. H., Adelaide, S.A.
1893. SIMSON, AUGUSTUS, Launceston, Tasmania.
1857. SMEATON, THOMAS D., Blakiston, Littlehampton, S.A.
1900. SMEATON, STIRLING, B.A., C.E., Adelaide, S.A.
1871. SMITH, ROBERT BARR, Adelaide, S.A.

1881. *Stirling, Edward C., C.M.G., M.A., M.D., F.R.S., F.R.C.S., Professor of Physiology University of Adelaide, Honorary Director South Australian Museum, Adelaide, S.A.
1886. *Tepper, J. G. O., F.L.S., Entomologist South Australian Museum, Adelaide, S.A.
1897. *Tore, W. G., I.L.D., M.A., B.C.L., Way College, Adelaide, S.A.
1894. *Turner, A. Jefferis, M.D., Brisbane, Queensland.
1889. Vardon, Hon. Joseph, M.L.C., J.P., Adelaide, S.A.
1878. *Verco, Joseph C., M.D., F.R.C.S., Lecturer on the Principles and Practice of Medicine and Therapeutics University of Adelaide, S.A.
1883. Wainwright, E. H., B.Sc. Lond., St. Peter's College, S.A.
1878. Ware, W. L., J.P., Adelaide, S.A.
1859. Way, Rt. Hon. Sir Samuel, Bart., D.C.L., Chief Justice and Lieutenant-Governor of South Australia, Adelaide, S.A.
1886. *Zietz, A. C., F.L.S., C.M.Z.S., Assistant-Director South Australian Museum, Adelaide, S.A.

Associates.

1901. *Basedow, Herbert, University, Adelaide, S.A.
1901. Collison, Edith, B.Sc., Adelaide, S.A.

APPENDICES.

FIELD NATURALISTS' SECTION

OF THE

Royal Society of South Australia.

EIGHTEENTH ANNUAL REPORT OF THE COMMITTEE,

FOR THE YEAR ENDING 30TH SEPTEMBER, 1901.

Evening Meetings.—Eight evening meetings have been held, at which the following papers, &c., have been read by the undermentioned authors :—

1900.

Oct. 16—"Colour in the Lower Animals," J. Aitken. "Notes on the Method of Fertilization of various Flowers," T. D. Smeaton.

Nov. 20—"Practical Demonstration in Rock Sectioning," E. J. Bradley.

1901.

April 16—"Notes on a Northern Trip," S. Smeaton, B.A.

May 21—"Observations on the Boys' Field Club Easter Excursion at Normanville," R. J. Clucas.

June 18—"Botanical Notes" (Teratology—Weather Forecasts by Plants—Diseases in Plants), T. D. Smeaton.

July 23—"The Roots of Plants—their Arrangement, Structure, and Function," E. Ashby.

Aug. 20—"Natural History Features of Lorne (Victoria)," W. H. Selway. "Insects and Entomology," J. G. O. Tepper, F.L.S.

Sept. 17—Chairman's Address (Annual Meeting), "The Flowers of Plants," S. Smeaton, B.A.

The attendance at these meetings, while not quite equal to that of last session, has been well up to the average of recent years. The course of papers on "Structural Botany," commenced last session, has been continued this year, when the roots and the flower have been dealt with. Besides botany, other widely

differing topics have been brought before themembers, such as colour in the lower animals, conchology, entomology, and rock sectioning.

The exhibits at these meetings have, as usual, been varied and interesting—birds, shells, plants, and insects forming the greater proportion. Amongst the exhibits may be mentioned the rare shell, *Acanthochites Matthewsi*, from Marino, and the local one, *Adamsia Adelaidæ*, from North Arm; the scale insect, which produces the manna found on Eucalypts; birds and plants from Nackara, not to be found near Adelaide; and beetles from various parts of the world. At one meeting it was mentioned that practical observations showed that the garden flowers, *Kennedya nigricans* and *Clianthus puniceus* were probably fertilised by the agency of birds.

Excursions.—Twelve excursions have been held during the year, of which the following is a list:—

1900.	Locality.
Oct. 13	River Sturt, from Blackwood to Darlington.
Oct. 27	Aldgate.
Nov. 12 (whole day)	Highercombe.
Nov. 24	Upper Sturt.
Dec. 8	National Park (Long Gully).
1901.	
Apr. 27	North Arm (by land, via Torrens Road).
May 25	(Henley Beach fixed, but not held, owing to wet weather).
June 22	Henley Beach.
July 20	Black Hill.
Aug. 17	Paradise and Hope Valley Reservoir.
Sept. 2 (whole day)	Barossa Waterworks.
Sept. 14	Montacute.
Sept. 28	Bridgewater.

The foregoing list includes two whole-day excursions, and embraces some fresh localities. The longest trips were those to the country between Highercombe and the River Torrens (near its junction with Kangaroo Creek), and the Barossa Waterworks, both places being visited for the first time by the section. The walk down the River Sturt between Blackwood and Darlington took in some of the scene of Mr. W. Howchin's recent investigations in regard to the interesting Cambrian Glacial Age discoveries. In this connection it may be mentioned that in the Section's Reports for 1893-4 it is recorded that rock formation noticed at an excursion to the River Sturt on May 12th, 1894, were ascribed by Mr. J. G. O. Tepper, F.L.S., to the Pre-Cambrian age, and special reference to the specimens then collected was made at the next evening meeting—May 15th, 1894.

Not many plants prievously unrecorded by the Section have been found during the year's excursions, but *Adriana quadripartita*, from River Sturt, and *Eriostemon difformis*, from Barossa, have not hitherto been included in the reports. An example of double flowers of *Epacris impressa* (a rare occurrence) was recorded from near Aldgate. The section was indebted to Mr. H. J. Armitage, of Houghton; Mr. W. Goodwin, of Highercombe; Mr. O. E. Menzel and friends, of Aldgate; Mr. C. Curnow, of Montacute; and to Messrs. O. H. Rogers and R. Caldwell, of the Barossa Waterworks staff, for assistance in connection with excursions; whilst the members were again placed under obligation to Sir Josiah and Lady Symon for their hospitality in entertaining the party at Upper Sturt. One excursion only had to be abandoned on account of inclement weather, although on other occasions rain somewhat interfered with the success of the outings. With these exceptions, the attendance has been well maintained. The usual dredging trip was omitted this year, but it is intended to arrange one early in the forthcoming summer.

Native Fauna and Flora Protection.—A separate report from this Committee shows that during the year under review the Birds Protection Act was passed by Parliament.

Library.—The Library started last year in connection with the Section has had several additions made to it this session through the kindness of members and friends.

Financial.—The receipts from subscriptions have again considerably exceeded the disbursements, but there has been no unusual outlay to make demands upon the funds. The subscriptions, which have been handed to the Royal Society, total £15, while the payments amount to £9 8s. 6d. The Royal Society's grant for the year is £10.

Membership.—Fresh accessions to the roll of membership have been made during the year, but your Committee would be pleased to see a greater number availing themselves of the privileges offered by the Section. The number now on the roll is 83.

S. Smeaton, Chairman.

W. H. Selway, Hon. Sec.

Adelaide, 16th September, 1901.

THIRTEENTH ANNUAL REPORT OF THE NATIVE FAUNA AND FLORA PROTECTION COMMITTEE OF THE FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA, PRESENTED AT THE ANNUAL MEETING OF THE SECTION ON 17TH SEPTEMBER, 1901.

Though it has not been thought necessary to call the Committee together, the efforts of individual members during the past year have not been altogether unsuccessful in furthering the objects for which it was formed

The Birds Protection Bill has been passed with some of the amendments suggested by us, others being unfortunately rejected. Our great object has, however, been attained in getting a number of species of birds protected during the whole year. The Commissioner of Crown Lands has issued placards containing lists of the birds which may not at any time be killed, of those protected during different periods of the year, and of those not protected; and we have been assured that steps will be taken by the authorities to enforce the observance of the provisions of the Act.

Recently a motion was tabled in Parliament for the purpose of transferring seagulls from the protected to the unprotected list, and being unsuccessful in his efforts to see the mover, steps were taken by the Secretary to call the attention of members of the Assembly to the facts of the case. Letters from several persons combating the proposal were published in the *Register*, the result being that the member who was taking action asked that the motion should be read and discharged.

Attempts on the part of farmers to obtain perpetual leases of forest lands at Wirrabara have again taken place in the past year, and the Secretary has written several letters to the *Register*, which he has reason to believe have in some degree helped to prevent the granting of such leases, with the consequent destruction of the portions of the forests proposed to be leased.

With great regret we have to record the death of one of our members, Mr. Charles White, who for several years has taken great interest in the work of the Committee, more especially in that relating to the protection of birds.

SAMUEL DIXON, Chairman.

M. SYMONDS CLARK, Hon. Secretary.

Adelaide, 16th September, 1901.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Receipts and Disbursements for the Year 1900-1901.

Dr. Receipts.	£	s.	d.	Cr. Disbursements.	£	s.	d.
To Balance brought forward	5	14	5	By Printing	4	2	3
" Subscriptions	15	0	0	" Postages	3	16	0
" Grant from Royal Society	10	0	0	" Attendance	1	0	0
				" Sundries	0	10	3
					9	8	6
				" Subscriptions, as per contra, paid over to Royal Society	15	0	0
				" Balance in hand	6	5	11
	£30	14	5		£30	14	5

Audited and found correct,

J. W. BUSSELL, } Auditors.
J. S. LLOYD, }

Adelaide, 17th September, 1901.

W. H. SELWAY,
Hon. Secretary and Treasurer.

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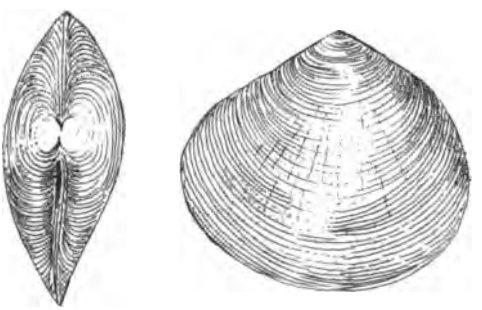

TELLINA BASEDOWI *(Tate).*

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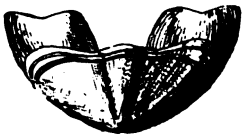

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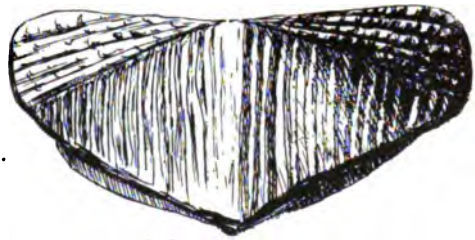

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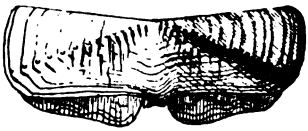

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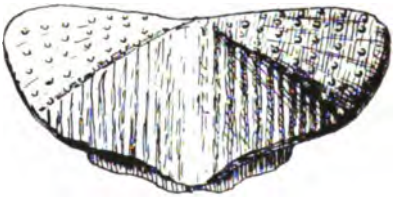

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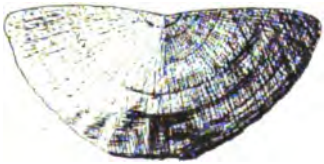

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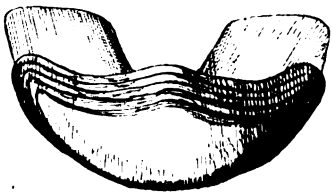

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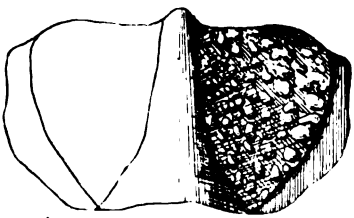

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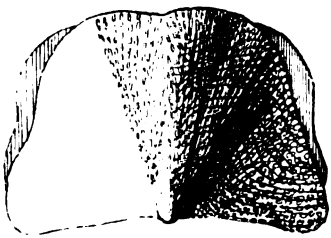

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E. Ashby, del.

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LIST OF FELLOWS

PROCEEDINGS, ANNUAL REPORT, AND BALANCE-SHEET OF THE FIELD NATURALISTS' SECTION

TRANSACTIONS

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XXVI., Part I.

[WITH ONE PLATE.]

EDITED BY WALTER HOWCHIN, F.G.S.

ISSUED JUNE, 1902.

Adelaide:

W. C. RIGBY, 74, KING WILLIAM STREET.

Parcels for transmission to the Royal Society of South Australia, from Europe and America, should be addressed "per W. C. Rigby, care Messrs. Thos. Meadows & Co., 34, Milk Street, Cheapside, London."

TRANSACTIONS AND PROCEEDINGS

AND

REPORT

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XXVI.

[WITH SEVEN PLATES.]

EDITED BY WALTER HOWCHIN, F.G.S.

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Royal Society of South Australia.

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[ELECTED OCTOBER, 1902.]

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Descriptions of New Species of Corals from the Australian Tertiaries.

By J. Dennant, F.G.S.

PART IV.

Plate I.

[Read November 5, 1901.]

Four species, distributed among the same number of genera, are discussed in this part. I am unable to place the first species described in any existing genus, and the following new one is instituted for its reception. It is perhaps nearest to Dasmia, *Edw.* and *Haime*, but is without the threefold division of the septa assigned to that genus; moreover, the cyclical arrangement is peculiar.

Genus Holcotrochus, *nov.*

Corallum free, compressed. Septa ten, in one cycle, and abnormal in development.

Costæ corresponding to septa, broad, equal, and separated by deep grooves. Columella parietal. No epitheca.

Holcotrochus scriptus, *spec. nov.* Pl. i., figs. 1*a*, *b*.

Corallum cuneiform, with roundly-pointed base. Calice ellip tical, the ratio of its major and minor axes being as 100 to 57.

The costæ form the most marked feature of this curious coral. Only ten are present, and they are equal in size, very prominent, broad at the top, and regularly tapering at the base, where they unite. Of these ten there is one at either end, and four on each of the broad surfaces of the corallum. All are ornamented laterally by a regular series of closely-set incisions or scribed markings at right angles to their length. A slender and somewhat sinuous rod-like process, mostly granular, but occasionally plain, in each of the deeply-grooved interspaces, extends from the calicular margin to the base, and serves to connect adjoining costæ. The costæ themselves and these slender rods form in fact the only wall of the corallum.

The septa, also ten in number, are continuations of the costæ, and rise perpendicularly from them to about one-sixth of the whole height of the corallum, when they bend sharply round towards the central fossa, the upper surfaces of all being horizontal and on the same level; they are coarsely granular on their sides, plain

superiorly, equal, stout throughout, but of diminished thickness towards their central terminations. For some distance down they are free, and enclose a deep, longitudinal fossa, but a little below the upper boundary of the wall they unite by stout processes to form a parietal columella.

Height of corallum, 5·5 mm.; length of calice, 3·5 mm.; breadth of calice, 2 mm.

Locality, &c.—In the Eocene strata at Muddy Creek, Victoria. Collected by Professor Tate. A single specimen (the type) has been in my cabinet for several years, but I hesitated to describe it until others came to hand. Just lately Mr. T. S. Hall showed me three rolled examples of the species which he had collected at Forsyths, on the Grange Burn, one of the sections included under the general term "Muddy Creek beds." Great care has to be exercised in collecting at Forsyths, as owing to the junction of the Miocene and Eocene there, the lower part of the section contains some derived Eocene fossils mixed with the prevailing Miocene ones. The type specimen, which is well preserved, came from an undoubted Eocene exposure just below Clifton Bank, and there is, I think, little doubt that the worn specimens collected by Mr. Hall are traceable to the Eocene. A very minute and young example of either this or a closely allied species was obtained by the same gentleman from the "Ledge" at Spring Creek.*

The next coral I place in Ehrenberg's genus Desmophyllum, but instead of six systems of septa, as in the type species *D. cristagalli*, it has eight. The number of cycles is besides not constant in the systems. Several writers have, however, drawn attention to the variability of the species of this genus in certain characters. Thus Ten.-Woods named a recent species from Fiji *D. quinarium*, in allusion to the five systems of septa present.†

Again, one of the earliest described species *D. Taurinense* Edw. and H., from the Falunien of Turin, has, according to De Fromentel, also five systems of septa.‡ In his detailed description of the same species, Michelin states that it is remarkable for ten stout septa (dix grosses lamelles), each of which is also accompanied by two very small ones.§ The base is also attenuated and not broad, as in the type of the genus. The full details and

* Since writing the above an example of this coral has been sent to me by Dr. Verco, who dredged it in Backstairs Passage at a depth of 22 fathoms. *Holcotrochus scriptus* is therefore recent as well as fossil. It is accompanied in the latter locality by another species of the same genus, which will be described shortly.

† On a New Species of Desomophyllum. Linn. Soc., N.S.W., 1878.

‡ Introduction à l'étude des Polypiers fossiles 1858-61.

§ Icon. Zooph., p. 39.

excellent figures given by Moseley of the two new species dredged by the Challenger may also be referred to as illustrations of the variability in the septal arrangement observed in forms belonging to the genus.*

Desmophyllum Joannense, *spec. nov.* Pl. i., figs. 2*a*, *b*.

One specimen only has been found, but it is well preserved. It is irregularly cornute in form, and gently tapering. Its basal extremity is not perfect, and I judge has been sharply broken off from its former attachment to a foreign body. The calice is open, much indented marginally, and slightly elliptical, the ratio of its major and minor axes being as 100 to 90.

Septa in eight systems and three cycles, of which the third is absent in two of the systems. The primaries are exsert, and, though unequal in size among themselves, are usually much stouter than the remaining orders. The secondaries and tertiaries also vary in size. One of the primaries, as shown in the drawing (Pl. i., fig. 2*b*), is formed of two uniting lamellæ. The total number of septa is 30, all of which project slightly beyond the wall. The latter is thin, and covered with a white, delicate epitheca, beneath which the costæ can be faintly traced as rows of very fine granules; they are apparently continuations of the septa. The epitheca is occasionally slightly wrinkled, and there are two or three small excrescences on the wall. There is no columella, and the central fossula is very deep.

Height of corallum, 13·5 mm.; diameters of calice, 5·25 and 4·75 mm.

Locality.—Eocene at Brown's Creek, near Joanna River, on the south coast of Victoria.

The third coral under notice in the present paper has been hitherto regarded as a variety of *Deltocyathus viola*, Duncan, from which it differs principally in being slightly instead of much compressed. It is, moreover, a restricted form, having, so far, been reported from Spring Creek only. Before describing it some remarks upon the generic position of its close ally, *D. viola*, are necessary.

In 1860 Tenison-Woods sent this species, under the name of *Turbinolia viola*, to Professor M. Duncan, who in describing it, first in 1864,* and again in 1870,† changed the genus to Caryophyllia. Subsequently Woods redescribed it as a Deltocyathus, at the same time giving a detailed diagnosis, which differs somewhat from that contained in Duncan's memoirs.‡ Afterwards,

---

*Report on Corals—Deep Sea Madreporaria, pp. 160-2, plates iv., v., vi.
† Ann. and Mag. Nat. Hist., third series, 1864, p. 162, pl. v., fig. 1.
‡ Q.J.G.S., vol XXVI., pp. 295-6, pl. xix., fig. 1.
§ Proc. Roy Soc., New S. Wales, 1877, pp. 191-2, pl. ii., fig. 3.

TRANSACTIONS AND PROCEEDINGS

AND

REPORT

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XXVI.

[WITH SEVEN PLATES.]

EDITED BY WALTER HOWCHIN, F.G.S.

Adelaide:

W. C. RIGBY, 74, KING WILLIAM STREET.

DECEMBER, 1902.

Parcels for transmission to the Royal Society of South Australia, from Europe and America, should be addressed "per W. C. Rigby, care Messrs. Thos. Meadows & Co., 34, Milk Street, Cheapside, London."

The form selected as type is subturbinate and very little curved. It is 28 mm. in height, with a broad circular calice 18 mm. in diameter (figs. 4*a*, *b*). The horn-shaped corallum (fig. 4*c*) is 32 mm. high, and the diameters of its slightly elliptical calice are 16 mm. and 15 mm. A tall cylindrical variety, though broken off at some distance from the base, is yet 37 mm. high. The best preserved calice in my collection belongs to a fractured corallum of similar outline; it is circular and 13 mm. in diameter (fig. 4*d*). Smaller examples than any of these, mostly horn-shaped and tapering, are also common.

Locality, &c.—Abundant in the Eocene of Brown's Creek, and rare at Hamilton Creek. These are neighbouring beds in the Aire River district, Victoria, both of which were discovered by Mr. Kitson in the latter part of 1899.

The species name is in compliment to Mr. H. Herman, Acting-Government Geologist, who, in conjunction with Mr. Kitson, assisted the late Professor Tate and myself in examining the tertiary deposits of this district in the early part of the present year.

EXPLANATION OF PLATE.

Fig.

1. *Holcotrochus scriptus*—*a*, corallum, 6 diam.; *b*, calice, 8 diam.
2. *Desmophyllum Joannense*—*a*, corallum, 2-5 diam.; *b*, calice, 5 diam.
3. *Deltocyathus subviola*—*a*, section of a corallum, showing internal structure of the calicle, 3 diam.; *b*, calice of type specimen, 6 diam.
4. *Parasmilia Hermani*—*a*, corallum, nat. size; *b*, calice, 2 diam.; *c*, corallum of another specimen, nat. size; *d*, calice of a third specimen, 3 diam.

NOTES ON THE LORANTHACEÆ OF THE WILLOCHRA VALLEY.

By CHAS. F. JOHNCOCK.

[Read November 5, 1901.]

The late Professor Tate, in his paper on "The Host Plants of the Australian Loranthaceæ," read before the Australasian Association for the Advancement of Science, January, 1898, remarks on the probable role played by some then undetermined species of birds in the distribution of *Loranthus*, and quotes Dr. Ramsay,* F.L.S., New South Wales, as saying of *Dicæum hirundinaceum*:—This species is universally dispersed over the whole of Australia; feeds on berries and fruits of various kinds, but seems to prefer those of *Loranthus*. This plainly accounts for the distribution of the *Loranthus* all over the districts frequented by the *Dicæum*, in which it is locally known as the "Mistletoe Bird."

In this district the Loranthaceæ occurring are *L. exocarpi*, *L. linearifolius*, and *L. pendulus*. *L. linearifolius* is found only in a few localities, and then not plentifully; almost exclusively on *Acacia sentis*, and only in the more liberally watered parts of the plains.

L. exocarpi is found on *Acacia sentis*, *Cassia Sturtii*, *Bossiaea Battii*, and *Santalum lanceolatum*. *L. pendulus* grows almost exclusively, and in some places in striking profusion, on *Santalum lanceolatum*. These last two occur in the scattered tracts of scrub which abound in varying area and frequency all along the eastern side of the valley.

In one instance only have I observed *Dicæum hirundinaceum* in this district, and then only a solitary pair, within the space of five years. Therefore, comparing the striking abundance with which *L. exocarpus* and *L. pendulus* are found, and the extreme rarity of *Dicæum*, one is compelled to seek other agents for the distribution of the plants in question.

Careful and patient observation convinces me that the birds playing this role are (1) the *Acanthiza*, known as the yellow-rumped tom-tit; and (2) *Ptilotus sonora*. While the *Acanthiza* does not actually eat the berries of *Loranthus*, it very frequently uses the pendant branches as a site for its nest. This alone

* Proc. Linn. Soc., N.S.W., Second Series, vol. I., p. 1,093, 1886.

almost insures the distribution of the seeds by adherence to the birds' feathers. Moreover, I have on a few occasions seen the viscid berries clinging to the backs and wings of these birds; and I once watched an *Acanthiza* rid itself of the adherent seed by removing it with its bill, and then by stroking its bill on a branch actually transfer the seed to a very favorable situation on the tree, a *Santalum lanceolatum*. This is no doubt a frequent occurrence in the nesting season of *Acanthiza*, which is at the time when the berries are ripe.

Ptilotus sonora.—This bird, now something of a pest in the fruit gardens in the hills, is fairly plentiful in this district, and I have very often observed it eating the ripe berries of *L. pendulus* especially, with very evident relish—almost greedily. It is rather a timid bird. This disposition in a locality such as this is perhaps caused through the presence of numbers of small hawks in the scrubs and the rather scant cover afforded. When suddenly startled it shows evident fear, and at once will endeavor to make good its escape by dashing with all speed from bush to bush, mostly using *Bossiaea* as its refuge, and on this species *(Bossiaea Battii)* the Loranthaceæ very frequently occur. While I cannot state that I have had visible proof that *Ptilotus* is the agent distributing the *Loranthus*, as above suggested, nevertheless, I feel confident that such is the case. In the watercourses on the sides of the hills, and for a short distance outward on the plain, *Acacia sentis* occurs abundantly, and *Bursaria spinosa* fairly frequently. In these positions *Ptilotus* is sure to be met with, and here, too, *L. exocarpi* is common. In these creeks, therefore, the habits of the bird and its association with the *Loranthus* point to its agency as the distributor of the seed. The wattle bird is occasionally to be met with in these creeks, and possibly may play some part also in the distribution, but I have as yet no evidence to offer with regard to this bird, although I hope to be able shortly to establish proof of its being a means of distributing the seeds of *L. linearifolius*.

Turning now to the question of "particular adaptation of the host plant to the requirements of its particular parasite," it may be worthy of note that in the case of *L. exocarpi* I have observed a tendency in the leaves to become very thick and fleshy where the plant occurs on *Bursaria*. In the case of *L. pendulus* there is a striking difference between the thinner, cleaner, and darker leaves of the plant as it occurs on the *Eucalypti* in the southern parts of the colony, and the thicker, duller, and lighter-colored appearance of the plant as it grows here in the Eremian region. But whether the differences noted are to be ascribed to any peculiarity in the nature of the host plants, or whether the widely different climatic conditions may not be the cause, I cannot say.

Yet another peculiar feature may be worth notice, and that is that while *Eucalyptus rostrata* grows luxuriantly along Spring Creek in its course through the Willowie Pastoral Company's estate, and also in the Willowie Forest, I have not so far observed either *Dicæum*, *Ptilotus*, or *Loranthus* in either tract. Nor again does the parasite appear, or only with extreme rareness, on *Casuarina quadrivalvis* in the Pekina Ranges, where once more *Ptilotus* and *Dicæum* are almost (or quite) absent.

Finally, while I recognise that the area I have had under observation is limited, to quote from Professor Tate's paper once more, "I have thought that a useful purpose might be served by bringing together additional facts as the outcome of field observations," and that a little more might be added to our knowledge of the distribution of these parasites.

On Eucalyptus Behriana, F. v. M.

By J. H. Maiden, F.L.S.

Government Botanist of New South Wales, Honorary Fellow Royal Society, South Australia.

[Read November 5, 1901.]

I desire to bring under notice *Eucalyptus Behriana*, F. v. M., which has long been looked upon as a peculiarly South Australian species, and some of the type localities are South Australian. It is of special interest to South Australian botanists by reason of the light it throws upon variation in the genus.

Following is the original description of the species :—

"Fruticose; leaves alternate, coriaceous, somewhat shining, lanceolate or ovate, acute, slightly oblique, thinly veined, dotted; umbels pedunculate, panicled, few-flowered; flowers small, nearly sessile; lid hemispherical, blunt or minutely apiculate; tube of the calyx obconical, bell-shaped, nearly twice as long as the lid; fruit half-ovate, sessile, not contracted at the top; valves of the capsule inclosed; seeds brown, streaked.

"In arid plains and on stony hills near the Avoca, Murray, and Gawler Rivers, and in Bacchus Marsh."—*Trans. Vict. Inst.*, I. (1855), 34.

At about the same time Mueller sent specimens to Miquel who was then engaged on his "Stirpes Novo-Hollandas." The latter independently described the species, and as his description is published in Ned. Kruidk., Arch. IV., 140 (1856,* not 1859, as mentioned in B.Fl.), an excessively rare work, I quote it, here :—

"39. *Eucalyptus Behriana*, Ferd. Müll. *E. pruinosa*, Behr. Herb. non Schauer. Fruticosa, ramulis teretiusculis summo apice compresso-angulatis foliisque subtus pruinosis, his ovato-lanceolatis inæquilateris acuminatis, basi in petiolum contractis, coriaceis, penniveniis, umbellis capitatis paucifloris (1-7-floris), in paniculis axillaribus lateralibus et terminalibus confertis, pedunculis umbellarum teretiusculis, calycis tubo parvo obconico-turbinato, operculo hemisphærico mutico vel apiculato quam tubus duplo breviore."

"In Nova Hollandia australi legit cl. Dr. Behr., autumno.

* 1856 is the date of the green paper-covered paper Part mainly occupied by Miquel's paper.

Teste Cl. Müller prope *E. polyanthemos* inserenda. Frutex 6-12 pedalis. Folia ad 3 poll, longa ½ lata."

Some of Mueller's type specimens of *E. Behriana* came from Bacchus Marsh, in Victoria, where also occurs a Box, the herbarium specimens of which have a very similar facies to that of *E. Behriana*. (The Box is a small fruited form of *E. hemiphloia*, F. v. M.) Mueller himself has confused his own *Behriana* with this form of *hemiphloia* in the distribution of herbarium specimens, and as others have followed his example, it is desirable that the confusion should be terminated if possible.

E. Behriana is always a Mallee. It grows in scrubs, and usually is five to ten feet high, though it sometimes forms small trees, which have rarely a diameter of as much as nine inches. The bark is always smooth, and commonly of a dirty-white colour, or, according to one observer, of "a dark oily-looking green." The timber is red. The flowers and fruit are small, with a panicled inflorescence, the opercula being blunt, and the fruit shiny and dark coloured. It bears seed abundantly. The leaves are comparatively broad, and are shiny.

As showing how difficult it sometimes is to deal with closely related forms, we have two specimens, apparently identical, sent by Mr. W. K. Bissill, of near Bendigo, Victoria, to the Melbourne Herbarium at different times. Mueller labelled one "*E. hemiphloia*, a form verging to *Behriana*," and the other "*E. Behriana*, transit to *E. hemiphloia*." We have also specimens, apparently identical, from the Mallee country of Victoria labelled variously by Mueller *E. hemiphloia*, *E. Behriana*, and *E. largiflorens*. All these are Mueller's own species, and I can give no better illustration of the way in which it is sometimes difficult to discriminate between species from herbarium material alone.

E. BEHRIANA, *F. v. M.*, and E. HEMIPHLOIA, *F. v. M.*

The confusion between these two species has been already referred to. It occurs with the small-fruited variety of *hemiphloia*, which in many herbaria goes under the name of *parviflora*. This in itself would be an appropriate name, but one at least of the specimens tentatively so named by Bentham (B. Fl., III., 217) is an Ironbark. I therefore propose for the small-fruited variety of *hemiphloia*, so extensively distributed over the greater part of the range of the species, the name *E. hemiphloia*, F. v. M., var. *microcarpa*. It is synonymous with *E. Woollsiana*, R. T. Baker, Proc. Linn. Soc., N.S.W., XXV., 684; R. H. Cambage, *ib*, 714. Mueller (Eucalyptographia) says:—

"*E. Behriana* approaches closely to *E. hemiphloia* from which it mainly differs in

"1. Never attaining the stately dimensions of that species.

"2. Bark remaining smooth from succession of outer layers.

"3. The leaves are as a rule (subject, however, to exceptions) shorter and broader.

"4. The panicles are less ample, by which means the umbels are not rarely arranged in a racemous manner.

"5. The flowers and fruits are smaller, their stalklets are less abbreviated, the lid is shorter and blunter, and the fruit-valves are less deeply enclosed."

To which may be added—Their timbers are totally different, that of *E. Behriana* being of a red colour; that of *E. hemiphloia* is the ordinary pale-coloured Box, whose appearance and properties are thoroughly well known.

In the field the species could never be confused for a moment, but as expert botanists have confused them in the herbarium, it is idle to contend that they do not possess a considerable degree of similarity. Perhaps this note will be the means of causing closer attention to the matter.

Under *E. Behriana*, F. v. M., Bentham (B.Fl., III., 214) describes a var. *purpurascens*, F. v. M., originally collected by Wilhelmi at Lake Wangaroo, South Australia. At p. 217 (under *E. hemiphloia*) he refers to South Australian specimens (Memory Cove and Kangaroo Island, R. Brown; Port Lincoln, Wilhelmi), and says—"In Mr. Brown's S. Australian specimens the leaves are smaller, but in Wilhelmi's they are the same as in the northern ones, and I can find no character to distinguish them. Both R. Brown and F. Mueller had given them the M.S. name of *E. purpurascens*. R. Brown's plant (collected 1802-5) was distributed from the British Museum under the number 4,735.

I have examined the type, labelled by Mueller "*E. purpurascens*, Ferd. M. Scrub of Port Lincoln, January, 1855. 4-6'. Carl Wilhelmi." Afterwards the same specimen was labelled by Mueller "*E. hemiphloia*, var.," with the note—"Pedicels none; lid short and blunt." All these specimens referred to *E. Behriana* and *E. hemiphloia* are, in my opinion, identical. They are usually easily recognised by their purple filaments, and may be referred to under the name *E. hemiphloia*, var. *purpurascens*. Judging from herbarium specimens alone, it is easy to see how botanists wavered, placing them at one time under *E. hemiphloia* and at another under *E. Behriana*.

E. Behriana and E. populifolia.

In Eucalyptographia, under *E. populifolia*, Mueller compares that species with *E. hemiphloia*, and refers to the latter species as known only from New South Wales and Southern Queensland, "and there confined to the coast districts or near to them." The

range of *E. hemiphloia* has been much extended since then, and I now desire to lay emphasis on the point that *E. hemiphloia*, in its var. *microcarpa*, has a closer similarity to *E. populifolia* than is usually supposed.

First of all, the following specimens have all been named *E. Behriana* or *E. hemiphloia* by some botanists. They are, however, all, in my opinion, *E. populifolia* :—

"Bastard Box," W. Baüerlen, Tarella, Wilcannia, August, 1887, No. 62. Bark persistent; tree, 30-50 feet. Some of the leaves are large aud coarse; similar leaves are found in the Bourke district. Others are lanceolate, and even narrow lanceolate.

Mossgiel (J. Brückner).

Wentworth (Mrs. Forde).

"*E. Behriana*, a kind of Box." No locality, but probably received from Mrs. Forde (Herb. Woolls). This is the specimen in regard to which Dr. Woolls (Plants of N.S.W., p. 52) announced *E. Behriana* as occurring in New South Wales, and I believe his determination was based on the plate of *E. Behriana* as depicted in Eucalyptographia, which it matches admirably. I have stated below that I think the fruits are those of *E. populifolia*.

E. populifolia has usually egg shaped or "poplar" leaves, which as a rule are different enough from those of var. *microcarpa* as it is commonly observed in western New South Wales, but lanceolate leaves are marked in specimens of *E. populifolia* from Ivanhoe, via Hay, N.S.W.; Wentworth, N.S.W.; Suttor River, Queensland; not to mention other localities. It is, in fact, strange as it may at first appear, not always easy to separate var. *microcarpa* from *E. populifolia*, not only as regards narrow-leaved forms, but as regards those that are broad-leaved. The leaves of *E. populifolia* have usually a wavy margin, and are usually, perhaps always, shiny—unless they have been collected wet. The venation of *E. populifolia* is usually more prominent. The habit of the two trees is different, that of *E. populifolia* being more erect than that of var. *microcarpa*. The timber of *E. populifolia* is red, as is also that of *E. Behriana*, but that of *E. hemiphloia* var. *microcarpa* is pale-coloured, as already indicated. The fruit of *E. populifolia* is not constricted at the orifice as in *E. hemiphloia* and its forms. (That of *E. Behriana*, as depicted in Eucalyptographia is not constricted, and I believe that fruits of *E. populifolia* have been depicted in error). Both have racemose inflorescence. *E. populifolia*, Hook, does not appear to have been recorded from South Australia. But in view of the New South Wales localities I have indicated which approach the South Australian border, I should not be surprised to hear of its occurrence in the latter State.

E. Behriana and E. largiflorens.

Mueller (Eucalyptographia) defines the difference between *E. Behriana* and *E. largiflorens* to be

1. The bark of the latter persists.
2. The leaves are conspicuously narrower, of thinner consistence, of duller hue, finer veined, and better provided with oil-dots.
3. Its panicles are more spreading.
4. The lids (at least often) are double, and the stamens not constantly all fertile.

In the field the species are at once separated by the large size of *E. largiflorens*, which has rough bark up to the small branches. The timber of both is red. In the herbarium I imagine that they would be readily separated by the broad, shiny leaves of *E. Behriana*, to mention no other characters.

E. Behriana and E. odorata.

Mueller (Eucalyptographia) remarks that while *E. odorata* could not be easily mistaken for *E. Behriana*, the former is discriminable by the mainly axillary inflorescence and persistent bark. *E. odorata* is a fairly large tree, while *E. Behriana* is a Mallee; the former is rough-barked, while the latter is smooth. The timber of both is red. I cannot think that there is any real difficulty in regard to the discrimination of the two species from herbarium material alone.

E. Behriana and E. incrassata, var. dumosa.

I think there is a greater similarity to *E. incrassata*, Labill, var. *dumosa*.

RANGE.

South Australia.

"39. Maerz. *Euc. Behriana*, Ferd. Mueller. *Euc. pruinosa*, Behr., non Schauer. Fruticose 6-12 pedalis. *E. polyanthema* proxima videtur (Müller)."

Besides those localities mentioned in the original description, Mueller quotes (Eucalyptographia) "in the hilly forest region of Wirrabara, near Crystal Brook, and Mount Remarkable on deep marly clay-soil" (J. E. Brown), and quotes Dr. Behr, "in the scrubs of Sandarac-Cypresses (*Callitris*) near the Gawler River."

Prof. Ralph Tate, in his Flora of South Australia, states that it is found in the northern agricultural areas, the Port Lincoln district, Kangaroo Island, and south of the Murray Desert. A few more specific localities for *E. Behriana* are desirable, as regards South Australia.

VICTORIA.

Bacchus Marsh (Mueller). A type locality.
Swan Hill, Murray River (J. G. Luehmann), 1890.
Mallee District (C. Walter), 1889.
Yarram Biack (C. Walter), 1886.
Wimmera (J. Reader).
Nhill (St. Eloy D'Alton).

NEW SOUTH WALES.

Mallee, Wyalong (H. Deane), about 1890.

Wyalong (Forester J. G. Postlethwaite), April, 1892. Height, 20′; diam., 6″.

Wyalong and Barmedman (R. H. Cambage). "Broad green-leaf Mallee." September, 1900.

Wyalong (W. S. Campbell), October, 1901.

In Proc. Linn. Soc., N.S.W., XXIV., 624, Mr. Deane and I gave a number of N.S.W. localities for *E. Behriana*, which are, however, those of *E. hemiphloia*, var. *microcarpa*. We followed Mueller in confusing the species, as has already been explained.

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

[Read April 8, 1902.]

XXX.

STAPHYLINIDÆ.

[ALEOCHARIDES.]

POLYLOBUS.

I have received from Mr. Lea specimens named *P. insecatus*, Fvl., *acceptus*, Oll., and *notus*, Oll. They are certainly not *Polylobi* nor even true *Aleocharini* but belong to the *Gyrophænini*. I believe Mr. Lea arrived at the names by comparison with the late Mr. Olliff's specimens, and I should say that they are probably identified correctly with the insects to which Mr. Olliff assigned those names, the last two agreeing well with his descriptions. I should have considered it impossible that the latter author could have regarded the insect received by me from Mr. Lea as *P. insecatus*, Fvl., as really that insect, were it not that in describing the two other species named above he said that they approached *P. insecatus*, Fvl. (though it should be noted that elsewhere he spoke of "the insect to which I refer the name *P. insecatus*" indicating that he did not claim certainty for his determination). As a fact it is about as far from agreement with M. Fauvel's description as any *Aleocharid* could well be, its facies being quite that of the genus *Gyrophœna* (whereas Fauvel says that *P. insecatus* has the facies of *Oxypoda exigua*), its pronotum and elytra being scarcely visibly punctulate except in the former having a few coarse punctures and the latter a very sparse inconspicuous puncturation, the *Gyrophœna* type of sculpture (whereas Fauvel calls those parts in *P. insecatus* "creberrime subtilissime punctatis") and its being particularly nitid even for a *Gyrophœna* (whereas Fauvel calls *P. insecatus* "vix nitidulus"). There seems then to be no doubt that *P. insecatus*, Olliff (nec Fauvel), *P. notus*, Oll., and *P. acceptus*, Oll., belong to the *Gyrophænini*. I am unable to refer them confidently to their genus in that group as, like Mr. Olliff, I am unable to obtain access to the diagnosis of *Brachida*; moreover none of the speci-

mens are in condition that allows of their labial palpi and ligula being examined. I see, however, no reason to place them elsewhere than in the genus *Gyrophæna* of which they have the facies completely and with which they agree in the large prominent eyes, pronotum margined at the base and furnished with a few large discal punctures, the sinuate hindmargin of their elytra, the presence of well-defined sexual characters on the sixth dorsal segment of the hind body, &c., &c.

[TACHYPORIDES.]

BARRONICA.

The diagnosis of this genus was published in Tr. R. Soc., S.A., 1895, p. 202, where I stated that I felt extreme difficulty in determining whether it ought to be placed near *Myllæna*, or ought rather to be associated with the *Tachyporides*, and gave the balance in favor of the former place. I have since come to the conclusion that the genus is identical with *Leucocraspedum*, Kraatz, founded for a small *Staphylinid* from Ceylon, and to which M. Fauvel subsequently assigned a species from N.S. Wales. I have not seen Kraatz's diagnosis of *Leucocraspedum*, but I think I know Fauvel's species as one that I have taken near Sydney, with which my *Barronica* seems to be congeneric. M. Fauvel places the genus in the *Tachyporini*, and I think he is right in so placing it, as in spite of its extremly *Myllæna*-like facies, the form of its maxillary palpi and the insertion of its antennæ are not those of the *Gymnusini* (to which *Myllæna* appertains).

LEUCOCRASPEDUM.

L. (*Barronica*) *scorpio*, Blackb. This species is at once distinguishable from all its congeners known to me (including *sidneense*, Fauv.) by its antennæ entirely testaceous, except a feeble infuscation of the apical joint. A long series of specimens presents no variation in this character.

L. validum, sp. nov. Minus nitidum; pube subtili ferruginea vestitum; nigrum, antennarum articulis basalibus 4 testaceis, pedibus palpisque plus minusve rufescentibus, elytris vix picescentibus; antennis brevibus, articulis 6°-10° gradatim magis fortiter (6° sat fortiter) transversis; capite prothorace que confertim subtilissime, elytris dense subtiliter vix rugulose, abdomine minus subtiliter minus confertim, punctulatis; prothorace subsemicirculari, convexo, fortiter transverso, basi utrinque sinuata, angulis anticis nullis posticis (superne visis) acutis retrorsum directis; elytris quam prothorax vix latioribus, ad suturum quam hic paullo longioribus, conjunctis sat transversis; abdomine retrorsum gradatim fortiter angustato.

Maris segmento dorsali 7° apice emarginato, feminæ late rotundato. Long., $1\frac{2}{3}$ l.

Easily distinguishable from *L. sidneense*, Fauv., by the pale coloring of the antennæ not extending beyond the 4th joint and joints 6-10 being quite (7-10 very) strongly transverse, joint 10 fully twice as wide as long. Also distinguished by its larger size, robuster build, evidently longer elytra, less nitid and more evidently punctulate pronotum, less slender hind body, darker palpi and legs, &c. I refer to this species examples from the Victorian mountains having elytra a trifle shorter and slightly more closely and finely punctulate, which, however, may possibly represent a distinct species.

Tasmania (Mount Wellington).

L. lugens, sp. nov. Minus nitidum; pube subtili ferruginea vestitum; totum nigro-piceum; antennis sat brevibus, articulis 5° 6° que vix (7°—10° sat fortiter, gradatim magis fortiter) transversis; capite prothoraceque confertim perspicue, elytris crebre minus subtiliter subasperatim, abdomine vix magis fortiter (apicem versus sparsim) punctulatis; prothorace fere ut *L. validi* conformato; elytris quam prothorax subangustioribus, ad suturam huic longitudine æqualibus, conjunctim leviter transversis. Long., 1 l. (vix).

Easily distinguishable from its described Australian congeners by its entirely dark antennæ, palpi and legs. Compared with *Sidneense* it differs also by its wider form, its much less nitid and much more conspicuously punctulate head and prothorax and by the distinctly closer subasperate puncturation of its elytra. The abdominal segments of my unique example are unfortunately much drawn into each other and therefore cannot be described very exactly. The specimen is a female and has the apex of its seventh dorsal segment widely rounded. This segment seems to be more finely and sparsely punctulate than in the other described Australian species. It is a trifle smaller (allowing for the shortage of the hind body) than any of my specimens of *sidneense*. The base of the elytra is distinctly narrower than the base of the prothorax.

L. elegantulum, sp. nov. Minus nitidum; pube subtili testacea vestitum; testaceum, abdomine rufo, antennarum articulis apicalibus 4 infuscatis, abdomine setis nigris instructo; antennarum articulis 6°—10° sat fortiter transversis; capite prothoraceque confertim subtilissime (minus perspicue), elytris confertim subtilissime (nihilominus nullo modo obsolete), abdomine minus subtiliter multo minus confertim, punctulatis; prothorace fere ut *L. validi* conformato sed perspicue minus fortiter transverso; elytris quam prothorax

paullo latioribus, ad suturam huic longitudine sat æqualibus conjunctim sat transversis; abdomine retrorsum gradatim sat fortiter angustato. Long., 1 l. (vix).

Readily distinguishable from its described Australian congeners by its entirely different coloring, its less strongly transverse prothorax, the very evidently finer puncturation of its elytra and hind body, &c. There is a slightly infuscate tone about the hind part of its elytra.

N. Queensland; taken by the late Mr. Cowley.

TABULATION OF CHARACTERS.

A. Antennæ entirely dark	*lugens*, Blackb.
AA. Antennæ (except apical joint) entirely pale yellow	*scorpio*, Blackb.
AAA. Antennæ with at least basal four joints pale and at least apical three joints dark.	
B. General color black or dark piceous.	
C. Subapical joints of antennæ very strongly transverse	*validum*, Blackb.
CC. Subapical joints of antennæ much less strongly transverse	*sidneense*, Fauv.
BB. General color testaceous or pale rufous ...	*elegantulum*, Blackb.

CILEA.

Under this generic name Mr. Lea (in Pr. L. Soc., N.S.W., 1898, pp. 531 and 532) described two species, and neither of them seems to me really to belong to *Cilea*. *C. rivularis* differs from *Cilea* by, *inter alia*, its very short tarsi (very much shorter than their tibiæ), the basal joint of which is very little elongated. Mr. Lea has been so good as to send me some specimens of this insect, but unfortunately they are so much clogged with gum tragacanth that it is impossible to treat such minute creatures as would be necessary to feel certain of what their generic place is. It is certainly not *Cilea*, however. Their tarsi seem too short even for *Tachinus*, but such examination as I can make does not reveal any other objection to placing them in that genus. I suspect, however, that an examination of fresh specimens would justify their having a new generic name. They are very much smaller than any *Tachinus* known to me.

C. amabilis.—I have four specimens from various parts of Victoria (the name confirmed by Mr. Lea). The non-carinate mesosternum of this insect separates it at once from *Cilea*, and it seems to be certainly an ordinary *Tachyporus*. I should add that Mr. Lea has himself expressed doubt as to whether his *amabilis* is a true *Cilea*.

TACHINUS.

T. novitius, Blackb. Since I described the male of this insect (from the Australian Alps) I have taken additional specimens near Fernshaw, in the Dividing Range, and am now

able to furnish further particulars. The species is a very variable one in respect of the coloring of the elytra and hind body, which vary from almost uniform reddish testaceous through forms in which the hind body is infuscate and the apical portion of the elytra infuscate or black, to a form in which the elytra and hind body are entirely black. The female is a very remarkable insect, having the elytra produced into a kind of lobe at their sutural angle, and from the apex of the lobe an aggregate of 4 or 5 spiniform setæ (very closely packed together) project hindward. The apical segment of the hind body is unfortunately a good deal withdrawn into the preceding segment in my female specimen, but I think it is trilobed dorsally, the middle lobe long, narrow, and acute, the lateral lobes vertical. The front tarsi of the female have their basal three joints moderately wide, the fourth very small, while in the male the basal four joints are all rather strongly dilated. I should add that I feel some uncertainty as to the structure of the seventh ventral segment in the male. In all my specimens a process of considerable size projects beyond the seventh segment, the suture between which and the seventh segment is not always easy to see, but the true apex of the seventh segment seems to be quadrifid, the median two teeth small and widely separated, the lateral ones larger. The seventh ventral segment is deeply emarginate in the male, widely rounded in the female. I think this species is a true *Tachinus*.

[STAPHYLINIDES.]

XANTHOLINUS.

X. Olliffi, Lea. This insect does not appear to me to differ from *X. phœnicopterus*, Fvl., a species to which Mr. Lea does not refer in his description. It is at any rate extremely close to it, and if distinct the difference should be specified. Mr. Lea sent me an example some time ago of his *Olliffi*, and it agrees perfectly with the description of *phœnicopterus*, which I had not previously been able to identify confidently with any Australian specimen, although M. Fauvel reports it as widely distributed in Australia.

[PÆDERIDES.]

LATHROBIUM.

L. australicum, Solsky. This insect should, I think, be referred to the genus *Dicax*.

[OXYTELIDES.]

ŒOPHRONISTUS (gen. nov. *Oxytelidarum*).

Caput magnum; palpi maxillares sat breves, articulo ultimo acuminato; oculi parvi, in capitis parte declivi laterali siti; antennæ geniculatæ, 11-articulatæ; prothorax (speciei

typicæ) modicus, supra fere æqualis (transversim late leviter impressus); elytra (speciei typicæ) punctulata; pedes modici; tibiæ anticæ extus emarginatæ et dentatæ (*Scaritidarum* simulantes); tarsi 3-articulati (?), articulo apicali quam ceteri conjuncti multo longiori; abdomen haud marginatum.

Seems to be near *Osorius* which however has five-jointed tarsi. The tarsi of this new genus consist of two extremely short joints and a third very much longer than the others together. I am not quite sure that there is not a very minute joint before that which appears to me to be the basal one, and I could not resolve the doubt without damaging my unique specimen. There are, however, at any rate only three joints that can be distinguished under a Coddington lens. The insect for which I propose this name is very easily recognisable as an *Osoriid* with less than five tarsal joints and with front tibiæ resembling those of a *Scaritid*.

Œ. australicus, sp. nov. Cylindricus; nitidus; setis brevibus subtilibus nonnullis instructus; obscure ferrugineus, capite metasternoque magis infuscatis; capite quam prothorax parum angustiori vix breviori, sparsius subtilius punctulato, antice truncato, supra antennarum basin spatio minuto rufo lævi tuberculiformi instructo, fronte leviter planata; oculis sat parvis, parum convexis, superne haud manifestis; antennis modicis, articulis basali sequentibus 3 conjunctis longitudine æquali (2° quam 3us paullo longiori et latiori, 3—6° parvis inter se sat æqualibus submoniliformibus, 7°—10° multo majoribus brevibus transversis, 11° angustiori conico); prothorace leviter transverso, antice truncato, ab apice ad partem medianam leviter (hinc ad basin fortius sinuatim) angustato, mox ante medium transversim late leviter depresso, fere ut caput punctulato sed basin versus puncturis sat magnis nonnullis impresso, sat anguste marginato, angulis posticis obtusis; elytris quam prothorax paullo longioribus, irregulariter punctulatis (sc. puncturis parvis cum nonnullis magnis sparsim intermixtis); scutello modico subtriangulari; abdomine sparsim sat fortiter punctulato; tibiis anticis intus sinuatim contortis, extus dentibus 2 (altero mediano compresso permagno, altero anteapicali paullo minori vix compresso,—his spinulis parvis obsitis) et unco acuto apicali armatis; tibiis intermediis fere ut antici sed intus rectis et extus dentibus paullo minoribus; tibiis posticis fere simplicibus, extus minute crenulatis sparsim longe spinuloso-ciliatis. Long., $1\frac{2}{3}$ l.; lat., $\frac{1}{2}$ l. (vix).

I have been especially careful to describe this insect very fully on account of my not having been able to define with certainty

the characters that require dissection for their determination; its anterior tibiæ resembling those of a *Scaritid* ought to render its identification easy. The eyes cannot be seen at all when the insect is looked at from above.

Victoria; I have forgotten the circumstances of capture.

BLEDIUS.

B. Cowleyi, sp. nov. Subnitidus; obscure ferrugineus, capite nigro, prothorace piceo-nigro, antennis (his apicem versus fere nigris) pedibus et abdomine subtus testaceis, mandibulis rufis; capite opaco vix manifeste punctulato, inter oculos fovea mediana impresso, sutura clypeali arcuata; oculis magnis, fortiter convexis, fortiter granulatis; prothorace quam caput vix latiori, modice transverso, longitudinaliter profunde sulcato, grosse sat crebre punctulato; elytris crebrius sat subtiliter (sed nullo modo indistincte) punctulatis, quam prothorax paullo longioribus; abdomine subnitido, creberrime subtilissime punctulato. Long., 1¾ l.

This species is probably near *capitalis*, Fvl., from which, however, it evidently differs *inter alia*, not only by its darker color, but also by its puncturation. *B. capitalis* is described as having its pronotum "*subtiliter*" and its elytra "*vix fortius*" *punctulatis* (implying that the elytral puncturation is less fine than that of the pronotum), whereas in the present species the pronotum is impressed with large coarse punctures (fully as coarse as in the European *B. fracticornis*, Payk), while the elytral puncturation is much finer than in *B. fracticornis*.

Queensland; taken near Cairns by the late Mr. Cowley.

B. Adelaidæ, Blackb. This species must, I think, be removed from *Bledius* and placed in *Trogophlœus*.

B. pontilis, sp. nov. Minus nitidus; breviter albido-pubescens; piceus, elytris pallide testaceis (circa discum leviter infuscatis), antennis piceo-testaceis basin versus dilutioribus, pedibus rufo-testaceis; capite creberrime subtilissime subaspere punctulato, inter antennas leviter bi impresso, oculis valde prominentibus, grosse granulatis; prothorace quam caput paullo latiori, sat fortiter transverso, longitudinaliter subtiliter canaliculato, creberrime subtilissime punctulato; elytris confertim sat subtiliter (quam pronotum multo minus subtiliter) punctulatis, quam prothorax sat longioribus; abdomine sat nitido, subtilissime punctulato. Long., 1½ l.

Not unlike the European *B. atricapillus*, Germ., but evidently larger and *inter alia* the prothorax much wider; also probably resembles *B. convexifrons*, Fvl., but that species is said to be much smaller than *B. atricapillus*, and to have its prothorax.

"*parum transversus*," whereas in the present species the prothorax is notably large aud wide, a character that also distinguishes it *inter alia* from *B. Caroli*, Blackb., to which it is also allied. From a certain point of view the non-infuscate disc of each elytron appears as a faint pale spot.

S. Australia; at Murray Bridge.

Tabulation of Species of Bledius.

As I have now described 8 *Bledii*, it seems desirable to furnish a tabulated statement of their characters. Of the 5 Australian species described by M. Fauvel I unfortunately know only one, and as that learned author has not happened to describe minutely all those parts of his species which I find lend themselves most conveniently to tabulation I am unable to include in my tabulation the four of his species that I have not seen. The same remark applies also to the one *Bledius* that Sir W. Macleay described. It is, however, quite clear from the descriptions that all those five are very different from those I have described.

A. Elytra quite distinctly punctulate.
- B. Pronotum coarsely and deeply punctured (like that of *B. fracticornis*, Payk.
  - C. Eyes comparatively small. Basal joint of antennæ dark ... . *minax*, Blackb.
  - CC. Eyes much larger. Basal joint of antennæ pale ... ... *Cowleyi*, Blackb.
- BB. Pronotum not coarsely and deeply punctured.
  - C. All the basal four joints of the antennæ much longer than wide ... . *insignicornis*, Blackb.
  - CC. Antennæ not having their basal four joints elongate.
    - D. Pronotum opaque.
      - E. Elytra very closely punctulate ... *injucundus*, Blackb.
      - EE. Elytra much less closely punctulate.. *ovensensis*, Blackb.
    - DD. Pronotum very nitid ... ... *infans*, Blackb.

AA. Elytra indistinctly (not more distinctly than in *Trogophlœus exiguus*, Er.) punctulate.
- B. Eyes extremely prominent and very coarsely granulate.
  - C. Prothorax very large, scarcely narrower than the elytra, strongly transverse ... *pontilis*, Blackb.
  - CC. Prothorax much smaller, notably narrower than the elytra, feebly transverse ... *Caroli*, Blackb.
- BB. Eyes feebly convex and feebly granulate ... *phytosinus*, Fvl.

OXYTELUS.

O. wattsensis, sp. nov. Mas. Robustus; sat nitidus; niger, elytris vix picescentibus circa suturam (præsertim versus apicem) rufescentibus, pedibus testaceis, exemplorum nonnullorum mandibulis apicem versus rufescentibus; capite magno (quam prothorax vix angustiori), postice sparsim dupliciter (subtiliter et sat fortiter) punctulato, haud

striolato, fronte inter tuberculos antennarios arcuatim depressa, vertice medio longitudinaliter foveato; oculis sat magnis, minus convexis, minus fortiter granulatis, longitudinaliter vix ultra capitis partem medianam pertinentibus; antennis brevibus, articulis 1° quam sequentes 3 conjuncti vix breviori 2° parvo quam latiori parum longiori 3° elongato (quam 2us circiter dimidia parte longiori) 4° 5° que minutis moniliformibus vix transversis (quam 2us sat minoribus) 6°—10° transversis] (gradatim magis fortiter, 10° quam longiori circiter triplo latiori) 11° breviter conico fortiter transverso, articulis basalibus 4 glabris nitidis (ceteris opacis pubescentibus); prothorace quam longiori duplo latiori, quam capitis pars postica magis fortiter magis crebre punctulato, haud striolato, 3-sulcato et latera versus impresso (fere ut *O. sculpturati*, Grav.), lateribus bicarinatis, parte inter carinas verticali; elytris fortiter transversis, quam prothorax haud longioribus, fortiter minus striolatim punctulatis; abdomine alutaceo vix manifeste punctulato, segmento 6° ventrali ad apicem tuberculo armato ante tuberculum impresso.

Feminæ capite quam prothorax multo angustiori, pone oculum brevi, antice quam maris multo minus profunde depresso, cum pronoto, magis crebre magis fortiter punctulato, vertice multo magis inæquali, segmento ventrali 6° simplici. Long., 2 l.; lat., $\frac{3}{5}$ l.

Resembling *O. melas*, Fvl., in build but somewhat more elongate and *inter alia* with the pronotum and elytra very differently sculptured. Perhaps also bears a general resemblance to *O. scabrellus*, Fvl., but differs *inter alia multa* from that species by its very strongly clavate antennæ and its non-strigose head.

Victoria (near Fernshaw on the Watts R) and Tasmania.

O. flavior, sp. nov. Mas. Præcedenti (*O. wattsensi*) affinis; piceo-brunneus, nonnihil flavescens, capite antennis (basi excepta) elytris (indeterminate, sed præsertim apicem versus) abdomine (maculatim) et corpore subtus (maculatim) plus minusve infuscatis, pedibus (genubus anguste piceis exceptis) testaceis; capite postice et prothorace quam præcedentis multo magis crebre magis fortiter (fere ut præcedentis feminæ) punctulatis; statura minus lata magis elongata; cetera ut *O. wattsensis*.

Feminæ capite quam maris multo minori. Long., $1\frac{3}{5}$—2 l.

The female differs from that of the preceding species very little except in respect of color and of its narrower and more elongate form. In the male the sculpture of the head and pronotum is

very much coarser and closer than in the male of *O. wattsensis*, —this difference being especially conspicuous on the portion behind the eye where in *wattsensis* the surface is very nitid and has only a few very fine punctures (intervals among the punctures four or five times as large as a puncture) while in the present species the punctures are much larger and closer. The antennæ of *wattsensis* are a little more strongly clavate than those of *flavior*, both resembling the antennæ of *O. melas*, Fvl., and being much more strongly clavate than in most European *Oxyteli* (e.g., *sculpturatus*, Grav.).

Victoria (Dividing Range and Australian Alps).

O. parumpunctatus, sp. nov. Fem. sat robustus; sat nitidus; niger, elytris mandibulis pedibusque rufis, femoribus plus minusve infuscatis; capite quam prothorax sat angustiori, antice depresso fortiter crebrius (postice magis subtiliter magis sparsim) punctulato, haud striolato; oculis sat magnis, minus convexis, minus fortiter granulatis; antennis modicis, modice clavatis, articulis 5°—10° transversis; prothorace quam longiori sat latiori, fere ut capitis pars postica punctulato, obsolete 3—sulcato et latera versus late minus leviter impresso; elytris fortiter transversis, quam prothorax parum longioribus modice latioribus, fere ut prothorax (sed paullo magis fortiter, obsolete striolatim) punctulatis; abdomine sat nitido sparsim subtilius punctulato. Long., 2 l. (vix).

The strong sparse even puncturation of the elytra, with scarcely any trace of striolation distinguishes this species from its previously described Australian congeners. Its eyes are moderately large, but notably smaller (and less strongly granulate) than those of *O. sculptus*, Grav. Its antennæ are much shorter than in that species and are rather strongly clavate, but somewhat less strongly than in *O. melas*, Fvl. Its pronotum is not laterally bicarinate as are those of so many of the Australian *Oxyteli*. In this it agrees with the insect that I take to be *O. vulneratus*, Fvl., which seems to be its nearest ally, and from which it differs *inter alia* by the still feebler sulcation of its pronotum as well as by the more nitid surface of its abdomen, and especially by the much more sparse puncturation of its elytra.

Victoria; in the Alpine district.

[PIESTIDES.]

GLYPTOMA.

I am able to report the occurrence in Australia of two species of this genus, which has not hitherto been recorded as Australian. It can be at once distinguished from the others of

the Australian *Piestid* genera which have their abdomen unmargined by its tarsi consisting of only three joints.

G. sculptum, sp. nov. Obscure ferrugineum; vix subnitidum; subglabrum; vix perspicue punctulatum; capite longitudinaliter obtuse 3—carinato; antennis brevibus robustis, articulis basalibus 7 moniliformibus 8°—10° transversis 11° breviter subconico, articulo basali quam sequentes (clavæ exceptis) paullo majori; prothorace transversim subquadrato, retrorsum leviter angustato, supra valde inæquali (interrupte inæqualiter obtuse longitudinaliter multicarinato), in disco planato, quam caput paullo latiori vix longiori, angulis posticis valde acutis, lateribus vix arcuatis; elytris quam prothorax sat brevioribus, carinis discoidalibus circiter 4 obtusis longitudinalibus ornatis Long., 1 l.; lat., ¼ l.

The only previously-described *Glyptoma* with which I am able to compare this species is the Hawaiian *G. Blackburni*, Shp. It does not seem to differ from that insect by any character likely to be generic; as a species, however, it differs widely by *inter alia* its very much smaller size and very much shorter elytra, as well as by its evidently less opaque surface.

Victoria.

G. sordidum, sp. nov. Præcedenti (*G. sculpto*) affinis; capite subobsolete 3—carinato; oculis magis prominulis; antennis minus robustis; pronoto in disco planato parum inæquali, utrinque versus latera subtiliter 2—carinato, angulis posticis minus acutis; elytris quam prothorax circiter tertia parte longioribus; cetera ut *G. sculptum*. Long., ¾ l.

This species can be at once distinguished from the preceding by its very much longer elytra, and notably smaller size. It also differs by the much less uneven surface of its head and prothorax and by its evidently convex eyes (in *G. sculptum* the eyes scarcely stand out distinctly from the general outline). The sculpture of the head consists of the disc being longitudinally and very widely and feebly convex, with a much narrower and somewhat more evident longitudinal convexity on either side near the eye. The pronotum is on the disc, almost even, but flattened, with a vague depression in the middle of the flattened portion and a feeble arched transverse sulcus near the base (in *sculptum* the disc is occupied by strong obtuse carinæ confusedly interrupted so as to seem like seriate tubercles from a certain point of view, and a strong arched transverse sulcus near the base); the lateral part on either side bears two fine raised lines (in *sculptum* these are quite strong costæ). The sculpture of the elytra is much the same in the two species.

N. Queensland; given to me by Mr. Koebele.

LISPINUS.

L. sulcipennis, sp. nov. Subnitidus; piceo-niger, pedibus et abdominis apice rufis, nonnullorum exemplorum abdominis segmentis postice angustissime testaceo-marginatis; capite minus crebre punctulato, antice longitudinaliter 2-impresso; antennis sat brevibus, articulo apicali quam præcedens manifeste minus lato; prothorace leviter transverso, fere ut caput sed minus crebre (parte mediana longitudinali anguste lævi) punctulato, utrinque sulco sat elongato (hoc externe prothoracis margine cariniformi valde incrassato contento) impresso, lateribus leviter sinuatis, angulis posticis sat acutis; elytris quam prothorax parum latioribus sat longioribus multo minus fortiter multo minus crebre punctulatis, stria subsuturali alteraqua (hac mox ante humerum sita) integris profunde impressis; abdomine inæqualiter (a basi ad apicem gradatim minus crebre minus fortiter) punctulato et longitudinaliter strigato, segmentis punctis singulis magnis utrinque impressis. Long., 4½ l.; lat., ½ l.

Readily distinguishable from the other known Australian *Lispinus* by the sulciform stria which is placed close to the beginning of the lateral declivity on each elytron. A species from New Caledonia seems to agree with it in this respect (except that in the latter the stria is described as "fine")—though in other respects very different. The sculpture of the abdomen becomes finer and more sparse conspicuously from base to apex of each segment and also slightly from base to apex of the whole abdomen. In some examples each segment is narrowly and conspicuously edged with testaceous behind, and in others there is no trace of that coloring. The difference is not caused by the greater or less display of a connecting membrane.

N. Queensland (collected by the late Mr. Cowley, of Cairns).

[HOMALIIDES.]

HOMALIUM.

H. tasmanicum, sp. nov. Sat latum; parallelum; sat depressum; rufo-ferrugineum, antennis apicem versus elytris postice abdominisque disco infuscatis; capite fortiter transverso, sparsius fortius punctulato, in clypeo utrinque impresso, ante ocellos profunde anguste longitudinaliter sulcato, ad basin sat truncato; oculis modicis, in capitis parte antica sitis; antennis modicis, articulis basali sat elongato 2° parvo 3° quam hic sat longiori 4° 5° que quam 2us paullo minoribus submoniliformibus 6°—11° fere nigris (6°—10° transversis, 6° quam 7us minori, 7°—10° inter se sat æqualibus, 11° quam 10us sat longiori); prothorace quam longiori fere duplo

latiori, fere ut caput punctulato et quam hoc vix latiori; disco obsolete inæquali, latitudine majori ante medium sita, lateribus arcuatis postice subsinuatis, angulis posticis obtusis bene definitis; elytris quam prothorax fere duplo longioribus vix latioribus minus fortiter magis crebre punctulatis; abdomine subopaco, creberrime subtilissime punctulato. Long, $1\frac{3}{5}$ l.; lat., $\frac{1}{2}$ l.

The large head of this species,—about the same size as the prothorax,—gives it a facies that suggests the thought of *Phlœobium clypeatum*, Er.; it seems however to be a true *Homalium*, presenting the characters Lacordaire attributes to the Tribe *Homalides* and agreeing with *Homalium* generically in its comparatively long elytra, its unarmed mandibles and its hind tarsi with their basal four joints short, equal and simple. The irregularities of the disc of the prothorax consist in its being flattened, the flattened space being bounded on either side by a space (extending nearly to the lateral margin) which separately is feebly convex; in this convex portion there is a feeble rounded impression near the lateral margin. I have a *Homalium* in my collection taken on the Victorian mountains which differs from the unique example described above in being smaller (long., $1\frac{1}{5}$ l.), its general color darker (ferruginous *brown* rather than *red*), its head notably smaller as compared with the prothorax and its prothorax smaller as compared with the elytra. I cannot specify any other difference between the two and am disposed to think them male and female of one species with sexual characters more or less analogous to those of *Anthophagus*.

Tasmania.

H. Morrisi, sp. nov. Modice latum; minus parallelum; minu-depressum; piceum, antennis basi palpis pedibusque dilutis oribus, prothoracis lateribus elytrorum lateribus (præsertim ad humeros) et abdominis lateribus apiceque plus minusve dilutioribus; capite modico crebre punctulato, utrinque ante ocellos longitudinaliter late sulcato (sulcis ad apicem continuis sed ad partem mediam subobsoletis); antennis modicis, articulis basali sat elongato 2° sat brevi 3° quam 2us paullo longiori 4° 5° que inter se sat æqualibus quam 2us paullo brevioribus 6°—10° longitudine inter se sat æqualibus sed gradatim latioribus 11° manifeste longiori; prothorace sat transverso, quam caput paullo minus crebre punctulato, in disco foveis ovatis 2 impresso, lateribus sat late deplanatis, angulis posticis rectis; elytris quam prothorax fere duplo longioribus, crebre subrugulose strigosc - punctulatis; abdomine supra creberrime subtilissime punctulato, subtus coriaceo opaco et crebre leviter æqualiter punctulato, minus sparsim aureo-pubescenti. Long., $1\frac{1}{5}$—$1\frac{1}{2}$ l.; lat., $\frac{2}{5}$ l.

Extremely like the European *H. rivulare*, Payk, and colored quite similarly. Placed beside *H. rivulare*, it is seen to differ as follows:—The puncturation of its head pronotum and elytra is considerably closer, that of the elytra is also different in character (the punctures being much confused and run together by longitudinal and oblique strigosity), the ventral segments are opaque (being densely coriaceous and also covered with somewhat close and even, but lightly impressed puncturation), and much more closely clothed with fine golden hairs; the tarsi are very evidently more slender, and the elytra are distinctly less elongate.

S. Australia; taken near Adelaide by Mr. P. D. Morris.

[PROTEINIDES.]

Of this sub-family of the *Staphylinidæ*, which has not been previously recorded as Australian, I have before me two Australian species, for which it seems necessary to form a new genus. Lacordaire places in this tribe the genus *Glyptoma*, of which I have described some species above; Kraatz, however, places the latter among the *Piestides* on account of the form of its hind trochanters, and I have adopted his reference.

ANEPIUS (gen. nov. *Proteininorum*).

Palpi maxillares modici, articulo ultimo fere filiformi, quam penultimus multo longiori; caput breve transversum (ut *Megarthri*); oculi sat magni parum prominuli; ocelli nulli; antennæ (ut *Phlæobii*) elongatæ, 11 articulatæ, articulis basalibus 2 quam sequentes 5 robustioribus, 3°—7° elongati-obconicis, 8°—11° vel. 9°—11° clavam laxam formantibus; prothorax transversus, fere ut *Phlæobii* conformatus; elytra abdominis basin tegentia; abdomen breve, minus late marginatum, postice angustatum; pedes modici; tarsi breves, inter se sat æquales, quam tibiarum dimidium breviores, articulis basalibus 4 brevissimis subdilatatis (apicali quam ceteri conjuncti vix breviori); corpus minus depressum, grosse punctulatum, minus dense pubescens.

Having only a single specimen each of the insects for which I propose this generic name, I am unable to state those of the characters which would require dissection for their determination, and it is possible that I may have quoted as generic some characters that the discovery of additional species may prove to be merely specific. The essential characters distinguishing the genus among the *Proteinides* (as diagnosed by Kraatz) are its very short tarsi with basal four joints subdilated, and together scarcely longer than the fifth joint, together with the absence of a frontal ocellus, elongate antennæ (like those of *Phlæobium*) and a head resembling that of *Megarthrus*. In facies it resembles *Megarthrus*.

A. raucus, sp. nov. Nigro-piceus, pedibus dilutioribus; subnitidus; capite confertim subtilius, prothorace crebre subgrosse, elytris grosse minus crebre, abdomine antice grosse postice subtilius rugulose punctulatis; capite utrinque longitudinaliter impresso; antennarum clava indeterminate 4—articulati; prothorace longitudinaliter 4—impresso (partibus impressis externis minus perspicuis), angulis posticis vix emarginatis elytris quam prothorax circiter duplo longioribus. Long., $1\frac{1}{5}$ l.; lat. $\frac{2}{5}$ l.

The sculpture of the pronotum consists of a fairly distinct (but not at all sharply defined) wide longitudinal impression—widest and deepest near the base—on either side of the middle, which (between the impressions) is somewhat strongly convex; these impressions are followed externally by another feeble convexity, between which and the lateral margin is another longitudinal impression, but this latter impression is scarcely traceable except in the middle of its length. Thus the pronotum might also be described as having three longitudinal obtuse convexities, between and outside which the surface is vaguely and unevenly depressed.

Victoria; Dividing Range.

A. Koebelei, sp. nov Ferrugineus, pronoti disco et abdominis lateribus infuscatis; capite crebre sat leviter nullo modo subtiliter, prothorace minus crebre sat fortiter, elytris minus crebre sat profunde sat grosse, abdomine fere ut prothorax, punctulatis; capite utrinque longitudinaliter impresso et circum marginem liberum manifeste reflexo; antennarum clava 3-articulata; prothorace sat transverso, sulco longitudinali mediano instructo, angulis posticis perspicue (fere ut *Megarthri depressi*) emarginatis; elytris quam prothorax fere sesquilongioribus. Long., 1 l.; lat., $\frac{2}{5}$ l. (vix).

So unlike the preceding (*H. raucus*) in most respects as to suggest hesitation about associating the two generically;—but they agree in what seems to me the essential character that prevents their being placed in any of the old *Proteinid* genera,—i.e. the structure of the tarsi, and therefore I think are best left together for the present. The present species is much more like *Megarthrus* in facies than is the other,—especially in respect of its prothorax,—longitudinally uni-sulcate and having the hind corners very conspicuously emarginate.

Australia (taken by Mr. Koebele; exact locality unknown).

Further Notes on the Botany of the Willochra Valley.

By Chas. F. Johncock.

[Read May 6, 1902.]

In the Handbook of the Flora of Extra-tropical South Australia, by the late Professor Tate, ed. 1890, p. 294, in defining the divisions of the Eremian Region, he says of District "S", "it overlaps 'M' and 'N.'"

The head of the Willochra Valley lies within District "N," and is covered by the overlap. These notes, which are the outcome of six years' careful work, largely refer to this overlap, and it is in the hope that they may prove useful in addition to the annotated schedule in the "Flora;" that they may do something towards completing the botanical knowledge of this interesting district; and that they may perhaps lighten the labors of other amateurs, I submit them to the notice of this Society.

Some of the notes refer to the purely overlapping species; some again refer to plants I believe hitherto unrecorded for this district, while others refer to plants which, though now fairly plentiful, have most probably been introduced through pastoral and agricultural operations.

In every case my observations have been carefully and thoroughly made, and, wherever opportunity arose, as carefully repeated and verified. In cases where I had any doubt I always submitted my identifications to Professor Tate for verification. I can therefore confidently affirm the correctness of the details given below.

1. Order Cruciferæ.

I. Barbarea vulgaris. 1/10/97, &c.

Only recorded for Adelalde district. Very common near Willowie township, &c. Usually stunted, but in favorable situations very tall and robust. Never eaten by stock. Evidently introduced in seed wheat, &c.

II. Sisymbrium cardaminoides. 23/9/99, &c.

Recorded for Cooper district; fairly common in gullies on west of Coomooroo Hill, but not out on the plains.

III. GEOCOCCUS PUSILLA (?). 10/9/98, &c.

Plentiful in Willowie township. This plant was dealt with in detail by the late Prof. Tate in his paper on "Dimorphism in Cruciferæ," read before this Society on October 4, 1898.

IV. CAPSELLA PILOSULA.

In this plant the leaves, as the plant grows here, show great divergence from the *obovate* form. They often approach to lanceolate, and to oblong, and may be entire, slightly notched or almost pinnate. The leaf form seems to vary with the situation of the specimen, and also with its nutrition.

2. Order Malvaceæ.

ABUTILON OTOCARPUM.

I discovered about a dozen plants in one small area in March, 1898. They reappeared in the same place in '99. They were then eaten off by travelling stock and since then have not grown. This species is given as not nearer than the Cooper district.

3. Order Zygophylleæ.

ZYGOPHYLLUM AMMOPHILUM. 28/10/00, &c.

Occurs plentifully in overflowed areas in wheatfields. Not widely distributed, but not rare within certain areas. Given for the Districts C, W, and M. It thus occurs east, west, and north of this locality, and on considerations to be mentioned later may be taken as fairly common in District S.

4. Order Amarantaceæ.

PTILOTUS ALOPECUROIDES. 29/9/99, &c.

Fairly abundant in the neighborhood of Willowie and surrounding plain. Given for all districts around this one (N). The plant occurs in all favorable situations, and should be included as for District N.

5. Order Urticaceæ.

URTICA INCISA.

Near all townships, in gardens and stock yards, and luxuriantly in places on the Willowie Station, near Melrose. Only given for southern parts of the State. Most probably introduced from the south with garden or field seeds, and in the fleeces of travelled sheep.

6. Order Casuarinæ.

I. CASUARINA QUADRIVALVIS. 29/9/00

Commonly in Pekina Range, west of Orroroo; not hitherto recorded for District N. Also on Mount Remarkable.

II. CASUARINA GLAUCA. 24/5/98

Plentifully in scrub lands. One of the overlaps from District S.

NOTE.—Since sending in my paper on the Loranthaceæ I have found growths of *L. pendulus* on *C. quadrivalvis*. On this host the *Loranthus* has the darker-green thinner-leaved form, as in the southern districts, instead of the paler and fleshier form on *Santalum*, *Bursaria*, *Bossiaea*, &c., out on the plains in this region.

7. Order Leguminosæ.

I. TEPHROSIA PURPUREA. 22/10/97

Melrose Creek; rather rare. Given only for the Finke district. Verified by Prof. Tate.

II. KENNEDYA PROSTRATA. 22/10/97

Mount Brown Station, and near Wilmington and Melrose, where it occurs fairly frequently. Perhaps introduced from southward among seed wheat or garden seeds, or in one of the methods below.

III. CASSIA STURTII. 16/9/96

In any scrubs; very common plant. One of the overlaps.

IV. ACACIA SENTIS. 23/10/97

Plentiful along creeks and damp situations. Also an overlap.

V. ACACIA HAKEOIDES. 2/10/96

Near creeks; rare. Also an overlap.

VI. ACACIA MICROCARPA. 14/9/00

On Coomooroo Hill and near Booleroo Creek. A rare shrub. Given for the Murray district.

8. Order Santalaceæ.

I. SANTALUM LANCEOLATUM.

Common in scrubs. An overlap.

II. CHORETRUM SPICATUM. 15/9/00, &c.

In the mallee country north of Booleroo Centre. Not recorded nearer than Murray district.

III. EXOCARPUS SPARTEA. 22/10/97

On Mount Remarkable. Certified by Professor Tate. Recorded for the F, M, and A districts. I discovered only two trees, both vigorous and well-grown, on the eastern slope of the Mount. I had no time to search for others, but as these two were not near each other doubtless a search would show more specimens.

9. Order Cucurbitaceæ.

I. MEMORDICA CHARANTIA. 27/6/99

A solitary specimen in Burke's Creek, Coomooroo Hill. Belongs to the Finke District.

II. MELOTHRIA MADERASPATANA. Sept./99

Willowie township. An overlap.*

10. Order Loranthaceæ.

LORANTHUS PENDULUS.

Booleroo Centre—Sept./98. Pekina Hills on *C. quadrivalvis* —Oct./01. Also plentifully on *S. lanceolatum* in this neighborhood. Not recorded for District N hitherto. Recorded for District W. Also dealt with in paper read Nov. 5, 1901.

11. Order Goodeniaceæ.

I. GOODENIA PUSILLIFLORA. Sept./99, &c.

An overlap.

II. SCAEVOLA SPINESCENS (?)

A local variety showing deviations from the typical form. I record its occurrence here in view of the possibility of its proving to be a new species. Occurs fairly freely in the neighborhood of Willowie township.

12. Order Solanaceæ.

I. SOLANUM LACUNARIUM. Sept./98

Occurs in Melrose Creek, south of Mount Remarkable. Recorded for Districts S and W. May, therefore, be an overlap. Referred to Prof. Tate.

II. SOLANUM ELLIPTICUM. 27/5/99

Coomooroo hill. Also an overlap. Prof. Tate.

13. Order Coniferæ.

CALLITRIS CUPRESSIFORMIS. June, '96, &c.

Plentiful in scrubs, and in the Pekina hills near Pekina Nob. In the mallee lands it is quite a common tree. Not hitherto recorded for any region north of the Adelaide district, so far as I am aware.

14. Order Orchideæ.

PTEROSTYLIS PEDUNCULATA. Sept./98

On the southern spurs of Mount Remarkable. Frequent in the sheltered gullies south-west from Melrose. Not hitherto recorded

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* Does not appear every season.

for any locality but Adelaide district. Referred to Prof. Tate, and certified by him *in. lit.* to the writer.

15. Order Liliaceæ.

I. THYSANOTUS EXASPERATUS. Sept./96, &c.

Very plentiful in favorable seasons in this neighborhood and further southward. An overlap from District S.

II. XANTHORRHŒA QUADRANGULATA.

On Mount Remarkable—28/10/97. On Pekina hills—12/98. I have been informed that it grows on the Ranges near Mount Brown also. Not recorded nearer than Adelaide district. It grows very freely in the above areas. I referred specimens to Prof. Tate.

16. Order Gramineæ.

ALOPECURUS GENICULATA. 20/11/00

Very rare. Willowie township. An overlap.

17. Order Filices.

LINDSÆA LINEARIS. 23/10/99

Melrose Creek, south of Mount Remarkable. In fair quantity in sheltered spots. Not recorded nearer than Adelaide district.

The following plants also occur :—

I. NITELLA (?) SP. At Willowie Springs, in brackish pools.

II. SPIROGYRA. Willowie Forest (Mar. /00) and at Willowie Springs (July /01).

III. FUNARIA HYGROMETRICA. In favorable situations, as walls, rocks, &c.

IV. MONOSTROMA (?) SP. At Willowie Springs, with Nitella.

These notes would be incomplete without a statement of the probable explanations of the presence of the above-named plants in this locality. I shall divide them into three classes :—

I. The overlaps from District S (and W) ;
II. The sporadic genera;
III. The plants from Adelaide district, &c.

I. THE "OVERLAPS."

The frequency of these overlaps appears to me to demand the southward extension of District S as far as Goyder's line. Many plants appearing in District N are limited to a narrow strip lying north of, say, Booleroo Creek. This strip is almost wholly

the Eremian or saltbush character; and the difference between the country lying on either side of the line is very marked. Even short distances will clearly demonstrate the limits of the 10-inch rainfall area, in many places, as proved by the harvest returns, the clearly defined edge of the mallee land, and equally plainly followed margin of the bluebush, &c. Once Goyder's line is crossed, going northward, such trees and shrubs as the mallee, *Casuarina*, *Melaleuca*, and different species of acacias are practically absent; and Salsolaceæ, *Cassia*, *Bossiæa*, the Eremian species of Santelaceæ, Eremophilæ, Zygophylleæ, and other characteristically Eremian forms become plentiful. Similarly many of the smaller plants have the same limit. Since boundary lines have been laid down for all the other districts, it would be convenient to define districts N and S in this locality, and such a boundary I feel certain is supplied by nature and science in "Goyder's line."

II. The Sporadic Genera and Species.

These must, I think, make their appearance largely by the transport of the seeds in the dust which is driven long distances from the north and north-west by the sirocco-like stormy winds of midsummer and early autumn. These winds travel at high speeds, have great powers of transporting dust and fine grit, or any light material, and seem, by a peculiar "bearing down" undulatory manner of blowing, to scoop up and raise to great heights the light loose surface material on the soil. May not seeds often be included in the dust, and thus be borne great distances, and when alighting in favourable spots become established for a few seasons at least?

Another manner of transport would very probably be in the intestines of migratory birds. Seeds of many plants, leguminoseæ, loranthaceæ, &c., would bear this treatment, and in many cases would actually benefit by it. This region is visited annually by many birds at nesting time, coming from the Far North. Such are quails, the black-faced lark, dotterels, cockatoo parrots, and shell parrots, among others.

The fleeces of sheep—often travelled great distances still, and necessarily more so when there were no railways—may be accountable for the dissemination of many species. Indeed, a more likely or more effective means of seed transport would be difficult to imagine.

The hoofs of horses, sheep, and cattle, if carefully examined when having adherent mud or dry clay will often yield grass seeds, and no doubt a careful and systematic examination would be rewarded in the detection of many other kinds.

The feet of shepherds' dogs carry clay, and often seeds in the

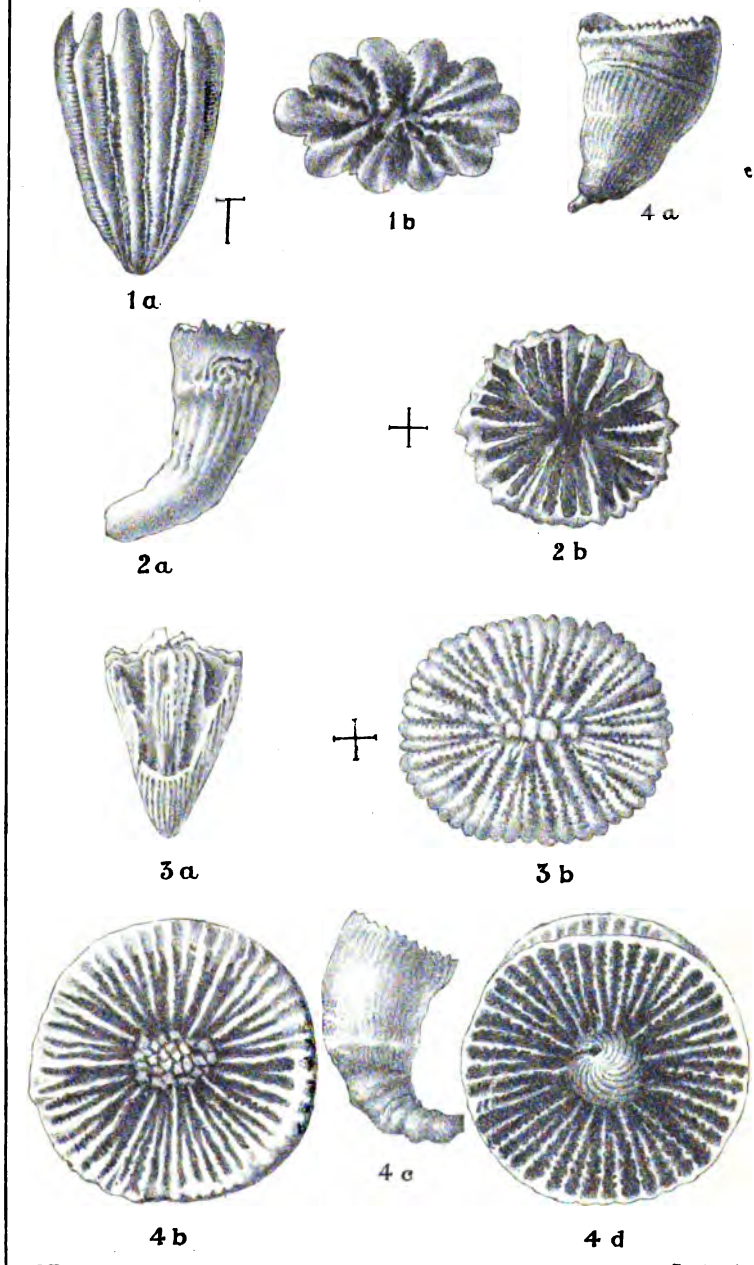
hollows under the feet and the spaces between the toes. Dogs are often lamed by the irritation caused by the presence of seeds in the situations named. As these animals often travel great distances with shepherds and drovers, there is at any rate the possibility that they play some part in carrying seeds, even though it may be granted they do but little.

The spores of *Nitella*, *Spirogyra*, &c., may be transported by wind, but more likely adhering to the legs and noses of animals, or on the feet and feathers of aquatic birds, as wild ducks, grebes, cranes, &c.

III. The Plants from Adelaide District, &c.

It may be contended, and with much force, that these species were introduced among seeds brought here by settlers, as vegetable seeds, flower seeds, wheat, oats, &c. In many cases this is almost a certainty, and may be taken as such in species like *Barbarea*, *Kennedya prostrata*, *Urtica incisa*, &c., but I do not think the above explanation can apply to *Callitris cupressiformis*, *Choretrum spicatum*, *Casuarina quadrivalvis*, *Pterostylis pedunculata*, *Xanthorrhœa quadrangulata*, *Lindsœa linearis*, *Arundo*, &c. Does not the presence of these plants point to the probability of a period when the Euronotian region ran well up the Flinders Range, when climatic conditions were different and better—perhaps in the early or middle tertiary periods?

In conclusion, I would again repeat that this paper consists of *Notes*, and must not be taken as more than the briefest statement of the points touched upon. I feel and know that much remains to be done in this locality, not only as regards its botany, but on other lines also; and I venture to express the hope that while tracts of untouched land remain—and that apparently will not be for many years longer—this Society will find workers willing to complete what is thus begun.



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TRANSACTIONS

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XXVI., Part II.

(WITH SIX PLATES.)

INCLUDING PROCEEDINGS AND REPORTS.

EDITED BY WALTER HOWCHIN, F.G.S.

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W. C. RIGBY, 74, KING WILLIAM STREET.

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Revision of the Australian Hesperiadæ.

By Edward Meyrick, B.A., F.Z.S., and Oswald Lower, F.E.S., Lond., &c.

[Read June 3, 1902.]

HESPERIADÆ.

Eyes glabrous. Club of antennæ large, strong, basal joint with long hair tuft. Anterior legs fully developed; posterior tibiæ usually with middle spurs. Forewings with all veins separate. Hindwings with 5 generally absent.

A large family, generally distributed, but absent from New Zealand. Most abundant within the tropics.

Many arrangements have been proposed by different writers on this group, but we have adopted the system of numbering the veins, which for brevity and clearness appears to us ample for the study and recognition of the different genera. The position of vein 5 of the forewing in relation with 6 and 4 proves a valuable generic character. The shape of the club, and the absence or presence of the stigma of the male, are also useful guides, and although the latter varies much in shape and size it is remarkably constant in individual species. The pattern of the wings and general coloring of the upper side are very similar in coloration and appearance, especially so in the Indo-Malayan forms, and it is highly probable that some of our species will prove to be synonymic with Oriental forms, but long series and further study are required to give anything approaching finality to the subject. The best and most important markings for identification will be found on the under surface of the hindwings, and the shape of the hindwings has been characterised where of any value. The markings of the female are generally similar to the opposite sex, but more strongly developed. The descriptions of larvæ and pupæ are given where known, and it will be noticed that a large proportion of the species feed on species of *Cladium*, and are usually full fed in October and November. We have enumerated eighty species, all of which are distinct. We have fully a dozen others, but not in a fit condition for description. The reputed Australian species are enumerated at the end of the paper.

We estimate that over 100 species will be found to occur in Australia. The group resolves itself into fourteen genera, *Telesto*, Bd., and *Trapezites*, Hüb., being the most predominant and widely distributed. Perhaps it is as well to mention that the drawing up of the generic characters and identifications has been made by Mr. Meyrick. The descriptive and other work in connection with the paper has been performed by the junior author. The specific descriptions may appear unnecessarily lengthened, but the abortive works of many of the older authors, which for the purpose of study are useless, disposes of this objection. We may state that we shall at all times be pleased to identify any specimens entrusted to us, and wish to thank the many kind friends for assistance, especially Messrs. Illidge, Waterhouse, Turner, Tepper, and Lyell.

Those genera asterisked (*) are confined to the Australian region.

In conclusion perhaps it is well to mention *Euschemon Rafflesiæ*, Mac. This insect is undoubtedly *not* referable to the Hesperiadæ. It has a large and well developed frenulum, which is invariably absent in the *Hesperiadæ* and in all other Butterflies. Superficially it recalls the *Agaristidæ*. In neura tion, however, it nearly approaches the *Hesperiadæ*. It stands by itself as a separate family, and must, we think, be regarded as related to the ancestral form of the *Hesperiadæ*, intermediate between them and the *Thyrididæ*.

Tabulation of Genera.

1.	Hindwings with five developed... ...	3	
	Hindwings with 5 obsolete	5	
2.	Palpi ascending, terminal joint long, slightly swollen near apex, porrected	4	
	Palpi sub-porrect, terminal joint moderate	8	*Exometæca.*
3.	Hindwings with 3 and 4 closely approximated	14	*Hasora.*
	Hindwings with 3 and 4 remote ...	13	*Badamia.*
4.	Forewings with 5 parallel to 4 and 6, slightly nearer 6 at base	6	
	Forewings with 5 rather approximated to 4	11	
5.	Posterior tibiæ without middle spurs...	7	
	Posterior with all spurs	8	
6.	Palpi ascending	7	*Phœnicops.*
	Palpi sub-porrect	5	*Mesodina.*

7. Forewings in male with costal fold ...	3	*Netrocoryne*
Forewings in male without fold ...	9	
8. Forewings in male with stigma ...	6	*Telesto.*
Forewings in male without stigma ...	10	
9. Palpi porrected	4	*Tagiades.*
Palpi obliquely ascending	7	*Trapezites.*
10. Terminal joint of palpi short	11	
Terminal joint of palpi rather long ...	9	*Apaustus.*
11. Terminal joint of palpi porrected ...	12	*Notocrypta.*
Terminal joint of palpi erect	13	
12. Forewings with 3 in male approximated to 4	11	*Erynnis.*
Forewings with 3 in male remote from 4	10	*Telicota.*
13. Forewings in male with costal fold, posterior tibiæ with all spurs	3	
Forewings in male with costal fold, posterior tibiæ without middle spurs	1	*Casyapa.*

1. CASYAPA, Kirby.

Club of antennæ moderate, gradually thickened, tapering to a fine point, bent, not hooked. Hind tibiæ densely fringed, and with only terminal pair of spurs. Forewings in male with costal fold; vein 5 equidistant from 4 and 6; vein 3 from well before end of cell; vein 2 three times as far from base of wing as from end of cell. Hindwings with termen evenly rounded; vein 5 obsolete; 3 from just before end of cell.

Differs from *Phœnicops*, Watson, by the costal fold.

1. CASYAPA CRITOMEDIA, Guer.

(*Hesperia critomedia*, Guer. voy. *Coq.*, ii., t. 18, fig. 6, 1829; *Thymele odix*, Boisd., voy. *Astrolabe*, Lep. p. 160, n. 2, 1832; *Chœtocneme caristus*, Hew., Desc. Hesp., p. 21, n. 1, 1807.)

Male, 70 mm. Head, palpi, antennæ, thorax, and abdomen bright ochreous-fuscous, terminal joint of antennæ darker fuscous. Legs, dark fuscous. Forewings elongate-triangular, termen nearly straight; dark ochreous-fuscous; basal half of wing clothed with short ochreous-ferruginous hairs; a broad transverse orange-yellow fascia, from costa slightly beyond middle to near anal angle, but not quite reaching it, broadest on costa and continued as a moderate costal streak to base, attenuated towards anal angle; cilia dark fuscous. Hindwings with termen evenly rounded; color and basal hairs as in forewings; a faint ochreous line along posterior extremity of cell; a very broad orange-yellow

band along termen, becoming much narrowed towards vein 6 and not near reaching apex of wing; cilia dark fuscous, becoming orange-yellow on lower half of termen. Underside of both wings dark fuscous, markings of upper side reproduced in pale yellow, but band on hindwings not reaching beyond vein 6; a pale yellow dorsal streak on forewings.

Herberton and Cape York, Queensland; three specimens in January. Occurs also in New Guinea.

2. Phoenicops, Watson.

Club of antennæ elongate, pointed, bent. Palpi ascending, terminal joint very short, obtuse. Posterior tibiæ without middle spurs. Forewings in male without characters; 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings; 5 obsolete.

An endemic genus, comprising the three largest and handsomest species in the Australian group.

1. Forewings dark fuscous, transverse band yellow ... ... 3 *Porphyropis*
2. Forewings fuscous, transverse band whitish ... ... 1 *Beata.*
3. Forewings orange, transverse band broken into two, large whitish hyaline spots ... ... 2 *Denitza.*

2. Phœnicops beata, Hew.

(*Netrocoryne beata*, Hew. Desc. Hesp., p. 22, n. 1, 1867; Ex. Butt. V. Hesp., figs. 2, 3, 1874).

Male and female, 64-80 mm. Head, thorax, and abdomen ochreous-fuscous Palpi, antennæ, and legs ochreous, palpi strongly mixed with orange; eyes dull carmine. Forewings elongate-triangular, costa gently arched, termen bowed, oblique, somewhat sinuate beneath apex; bright ochreous in male, ochreous-fuscous in female; markings of forewings in male as in *denitza*, but only one subapical spot; female with a moderately broad oblique transparent whitish fascia, from beyond middle of costa to just above anal angle, not quite reaching costa, containing a small triangular spot of ground color above middle, edges of fascia irregular, lower third constricted, costal edge ochreous; a small whitish spot beyond termination of cell, sometimes absent; cilia ochreous-fuscous. Hindwings with termen rounded; color of respective sexes as in forewings, but mixed with orange in female; a small subtriangular spot of semi-transparent whitish in posterior extre-

mity of cell, beneath which is a quadrate orange patch; two roundish semi-transparent whitish spots between veins 2 and 4 near termen, generally absent; cilia as in forewings. Underside of wings dull ochreous brighter in male; markings of upper side reproduced.

The male is similar in appearance to *denitza*, but at once distinguished by the absence of purplish neural streaks. The female is quite a different looking insect, but is readily known by the broad transparent fascia of forewings.

The larvæ feed on *Tristania*, *Eugenia*, and the camphor laurel. They draw two leaves together, one over the other in canopy-like form, with silken threads, and remain quiescent during the day, only emerging at night. Specimens feeding on the camphor laurel, which were protected by mosquito netting bound round the twigs, lived through the winter, changing in September and emerging in October. A second brood will change in February or March and be on the wing a fortnight or three weeks later. It is most active at dusk (Illidge).

Cooktown, Mackay, and Brisbane, Queensland; four specimens in November and December.

3. Phoenicops denitza, Hew.

(*Netrocoryne denitza*, Hew. Desc. Hesp., p. 22, n. 2, 1867; Ex. Butt. V. Hesp., f. 4, 1874; *Staud*, Ex. Sch., t. 100, 1888.)

Male and female, 64-68 mm. Head, palpi, legs, and antennæ orange, club of antennæ blackish. Eyes carmine. Thorax and abdomen orange in male, purplish in female, female beneath orange. Forewings elongate, triangular, costa nearly straight, termen bowed, oblique; in male orange, in female iridescent bluish purple, with costa broadly suffused with orange in middle, apical and hind-marginal area dull orange; all veins in both sexes generally outlined with bluish purple; 2 large rounded semi-hyaline whitish spots, edged with purplish; first at extremity of cell, immediately followed by a small oblique streak of orange, more pronounced in female; second immediately below and beyond first, surmounted by an ovate, and below by a rounded similar spot, upper only separated by a vein; 3 smaller similar spots midway between cell and apex, placed obliquely outwards, median largest, lower smallest, dot-like in male, and sometimes nearly obsolete; cilia orange, mixed with fuscous in female. Hindwings with termen hardly prominent in middle; color as in forewings; all veins outlined with bluish purple; an ovoid orange spot

in middle of wing, edged above by a broad fuscous fascia, not continued to margin, edged by a similar fascia beneath, from the lower edge of which proceeds another fascia towards anal angle, but not reaching it; interneural spaces on termen broadly orange, duller in female; basal hairs of male yellowish, in female dull fuscous; cilia as in forewings. Underside of both wings with color as above, markings reproduced, but less distinct; base of wings in both sexes orange; fascia of hindwings more distinct.

A beautiful species, at once recognised by its brilliant coloring; its habits are similar to *beata, Hew.* The flowers of *Buddlea neemda* and the loquat (*Eriobotrya Japonica*) are a great attraction for this insect during March and April. The late Mr. G. Barnard, of Duaringa, bred this species for larvæ, feeding on *Tristania conferta.*

Brisbane, Rockhampton, and Duaringa, Queensland; Port Darwin; four specimens in November and December.

4. Phoenicops porphyropis, n. sp.

Male, 64 mm. Head, palpi, thorax, and abdomen dark fuscous, eyes blackish, post-orbital rims yellow abdomen beneath orange. Forewings with termen oblique, dark fuscous, suffused with iridescent purplish; a moderately broad transverse bright yellow band, edges irregularly dentate, from immediately beneath costa beyond middle to inner margin just above anal angle; cilia fuscous. Hindwings with termen rounded; color and cilia as in forewings; a bright yellow, rather narrow patch of yellow on termen just below apex.

Apparently somewhat allied to *Carysta* (*chœtocneme*) *callixenus*, Hew. (Desc. Hesp., p. 21, 1867; Exot., Butt. v. Hesp., fig. 1, 1874), but differs by the presence of markings on hindwings and different color of forewings.

Johnstone River, North Queensland; one specimen received from Mr. R. Illidge, taken in February.

3. Netrocoryne, Feld.

Club of antennæ elongate, pointed, bent. Palpi porrected, terminal joint rather short, obtuse. Posterior tibiæ with all spurs. Forewings in male with costal fold; 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings; 5 obsolete.

The genus is confined to the Australian region.

5. Netrocoryne repanda, Feld.

(Reise Nov. Lep. iii., p. 507, n. 882, t. 70, fig. 10, 1867; (?) *Goniloba vulpecula, Prittw.*, Stett. Ent. Zeit., p. 187; n. 41, t. 3, fig. 2a. b., 1868.)

Male and female, 44-52 mm. Head orange, palpi fuscous above, white beneath. Antennæ ochreous, club and base blackish. Legs ochreous-fuscous. Thorax and abdomen fuscous. Forewings triangular, costa nearly straight, termen sinuate above and below middle; light ochreous, more or less infuscated; markings in male dull whitish, in female whitish, semi-hyaline, margined with dark fuscous; a large, somewhat quadrate spot at posterior end of cell, in female surmounted by a patch of yellowish on costa; a second, similar, beneath and beyond, surmounted by a smaller quadrate spot which touches both first and second spots, and enclosing a triangular spot of fuscous; in male the 3 spots are separate, in female the second quadrate spot is followed beneath by 2 smaller spots, lowest very small; an oblique transverse series of 3 sub-costal spots at three-fourths from base, placed on darker ground color, lower smallest; cilia dark fuscous. Hindwings with termen somewhat angulated in middle; color as in forewings; a rounded semi-hyaline whitish spot before middle; a dark fuscous fascia from middle of costa, curved round and ending on middle of inner margin; in female more or less broken up into spots; basal hairs ochreous-fuscous; cilia as in forewings. Under side of both wings with color and markings as above.

Although showing some variety in depth of coloring the species is easily recognised by the shape of hindwings. We have quoted *Goniloba vulpecula*, Prittw., as a synonym, but the figure in Ent. Stett. Zeit., is wretched, although undoubtedly pertaining to this species. Larva full fed, 30 mm. Moderate rather narrow, cylindrical, smooth, tapering towards posterior segments. Head black, body slaty-grey, second segment yellowish, third segment orange, with a transverse series of four round black spots two on each side of dorsal line; fourth and fifth segments, with similar series of four black quadrate spots; tenth segment with two larger quadrate black spots, placed on either side; twelfth and thirteenth segments orange, with a large black dorsal spot on extremity of each, and a series of sub-spiracular small black spots, three on either side of dorsal spots; two small black spots on anterior portion of eleventh segment; lines nearly straight, hardly waved; dorsal moderate, whitish, centred with fuscous throughout; spiracular, orange, narrow; subra-spiracular broad, whitish, well defined; sub-spiracular whitish. Spiracles orange, fuscous centred.

The young larvæ, which is semi-transparent yellowish-fus-

cous in its very early stages, cuts out a circular piece of the leaf, and forms a canopy-like shelter, leaving a small aperture for ingress and egress. On approaching adult size this shelter is deserted and a new one formed by drawing the edges of the leaves together, gradually extending the domicile until of suitable dimensions; in this last position the larva pupates during September and the imago is on the wing from November.

The eggs are laid in April on the upper side of the leaf. They are somewhat elongate-hemispherical in shape, and deeply grooved.

Feeds on *Callicoma serratifolia* (*Cunoniaceæ*), *Elæocarpus reticulatus*, and *E. cyaneus* (*Tiliaceæ*).

Sydney and Como, New South Wales; Brisbane to Cooktown, Queensland; November to March, nine specimens.

4. Tagiades, Hüb.

Club of antennæ gradual, elongate, pointed bent. Palpi porrected, terminal joint short, obtuse. Posterior tibiæ with all spurs. Forewings in male without characters; 5 parallel to 4 and 6; slightly nearer 6 at base. Hindwings with 5 rudimentary.

An Indo-Malayan genus of considerable extent; represented in Australia by the single known species. The insects are mostly colored fuscous and white, the species under review being no exception to the rule.

6. Tagiades janetta, Butler.

Trans. Ent. Soc., Lond., p. 519 (1870); *T. gamelia*, *Misk.* Proc. Roy. Soc., Q'd., p. 146 (1889).

Male, 50 mm. Head, thorax, palpi, antennæ, and abdomen dark fuscous. Palpi beneath whitish. Legs fuscous, strongly mixed with whitish. Forewings elongate, triangular, costa rather strongly arched, termen hardly bowed, oblique; fuscous with silvery-white markings; 2 somewhat trapezoid spots just before end of cell, their apices more or less confluent; 2 moderate spots beyond and below extremity of cell, first irregularly diamond-shaped; second below and before, somewhat triangular; an irregular oblique series of 3 subcostal spots at three-fourths from base, median smallest, upper sometimes surmounted by an additional minute spot; 2 small spots placed obliquely beyond and beneath lowest spot; cilia fuscous. Hindwings with termen rounded; white, basal half, except along inner margin, light fuscous; a

dark fuscous patch at apex, continued along termen to one-third, becoming more or less confluent with basal patch on costa; 2 moderate quadrate dark fuscous spots immediately preceding apical patch, lower largest and more distinct; cilia white, an apical patch fuscous. Under side of forewings with color and markings as on upper side, but cellular spots strongly confluent and surmounted by an elongate silvery-white mark; a more or less defined whitish sub-terminal band, broadest and more pronounced on lower third. Hindwings beneath white; a dark fuscous streak, commencing indistinct and narrow at base, suddenly becoming very broad and continued round to termen at one-third, termination abrupt; quadrate spots as on upper side; a small fuscous streak on termen above anal angle; cilia as above.

Somewhat allied to *Japetus*, Cr.

Brisbane to Cape York, Queensland; four specimens, November and December.

5. Mesodina, Meyr.

Club of antennæ elongate, pointed, bent, sub-porrect, terminal joint very short. Posterior without middle spurs. Forewings in male without stigma; 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings; 5 obsolete. The two species may be recognised as follows:

1. Forewings with whitish markings ... 8 *Halyzia*.
2. Forewings with yellowish markings ... 7 *Aeluropis*.

7. Mesodina aeluropis, Meyr., M.S.S.

Male and female, 30-44 mm. Head, palpi, antennæ, thorax, legs and abdomen dark fuscous, thorax and palpi beneath whitish, antennæ annulated beneath with white, club reddish-carmine, beneath white, abdomen and legs mixed beneath with whitish, posterior legs more whitish. Forewings elongate-triangular, termen gently bowed, oblique; dark fuscous, with yellowish markings; basal third more or less clothed with short golden hairs; a large quadrate spot in posterior end of cell, posterior edge slightly sinuate in middle, anterior edge nearly straight; a roundish spot beyond lower extremity of first; a second, similar, twice as large immediately beyond, below, and a third sometimes absent in male, small, placed exactly below middle of second; an oblique transverse row of three sub-apical spots, lower largest; sometimes absent in male; cilia dark fuscous, becoming mixed with whitish in middle of termen and almost wholly whitish around anal angle.

Hindwings with termen rounded; apex hardly prominent; color as in forewings; a large patch of rather long golden-ochreous hairs extending from base to near two-thirds not near reaching costa or inner margin; cilia as in forewings, but more whitish. Under side of forewings with color as above, upper half of termen broadly blue-grey; whole of cell filled up with orange, 3 posterior spots of upper side reproduced and confluent with posterior edge of cell; lower of the 3 sub-apical spots of upper side reproduced; cilia fuscous-grey, with dark fuscous spots at extremities of veins. Hindwings grey-whitish, somewhat lilacine; an obscure ring of fuscous before middle; a row of 3 or 4 similar rings at two-thirds from base; cilia greyish-fuscous.

Larva full fed, 35 mm. Cylindrical, very pale greenish; head thickly covered with fine white erect hairs, body finely clothed with similar hairs, but in a lesser degree. The whole larva is covered with a fine white powder, causing it to appear wholly white. It apparently lives head downwards, as the opening of the sheaf which it constructs is below, and not above as is usual in this group; before pupating the larva closes the opening by spinning a silken pad across it. It pupates head downwards. Feeds on *Patersonia, sp.* (*Iridaceæ*), and imago emerges during October.

The imago bears some resemblance to some species of *Telesto*, the female being similar to *donnysa* on forewings above.

Mount Kembla and Katoomba, New South Wales; several specimens bred in February and March.

8. Mesodina halyzia, Hew.

(*Hesperilla halyzia, Hew.* Desc. Hesp., p. 38, n. 1, 1868; Ex. Butt. v. Hesp. and Cyclop., f. 7, 1874; female, *A. and S.*, Vict. Butt., p. 125, 1893).

Male and female, 28-34 mm. Head, thorax, palpi, and abdomen dark fuscous, palpi and thorax beneath white. Legs whitish. Antennæ fuscous, annulated with white, club reddish, internally white. Forewings elongate, triangular, costa somewhat sinuate in middle, termen oblique, not bowed; dark fuscous with metallic reflections; markings whitish; a large, somewhat quadrate spot in posterior end of cell, sinuate anteriorly and postriorly; a cartridge-shaped spot immediately beneath and beyond, beneath which is another large quadrate spot, only separated by intervening vein; an oblique transverse row of 3 sub-apical spots, absent in male; cilia fuscous, basal half darker. Hindwings with termen rounded; without

markings; color and cilia as in forewings. Under side of forewings with color and markings as above; a broad dull bluish-white costal streak, narrowly mixed with yellowish on basal half and becoming very broad on apical and area of termen, but only reaching to two thirds of termen; cilia as above, but lighter and somewhat chequered with fuscous. Hindwings dull whitish, with a lilacine bloom; a very ill-defined row of fuscous dots, from three-fourths of costa towards inner margin at three-fourths, but not reaching it; an elongate streak of golden-fuscous, from base direct to anal angle, edged anteriorly by a streak of dull purplish; cilia as above.

A sombre-looking species, not like any other in the group.

The larva, method of pupating, and food plant are as in *aeluropis*.

Como, Katoomba, and Sydney, New South Wales; Perth, Western Australia; from October to April, three specimens.

6. *Telesto, Boisd.

Club of antennæ elongate, pointed, more or less bent. Palpi obliquely ascending or sub-porrect, terminal joint short, subconical. Posterior tibiæ with all spurs. Forewings in male with stigma; 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings; 5 obsolete.

In the following tabulation the characters are drawn from the male insects, unless otherwise specified:

1. Under side of hindwings reddish, markings and veins outlined with whitish; no markings in cell ... ... 13 *Picta*.
   Under side of hindwings creamy-white, markings black; cell with a large white centred elongate spot at extremity 2
2. Hindwings above with orange transverse fascia unevenly waved, posterior extremity produced ... ... 10 *Ornata*.
   Hindwings above with orange transverse fascia almost even throughout 1
3. Forewings above with markings large, shining-golden; cilia strongly barred. Size, 36 mm. ... ... 9 *Peronata*, male.

Forewings above, with markings much reduced in size; cilia barred. Size, 25-29 mm.... 5

4. Hindwings beneath bright yellowish - orange; markings black, comprising 3 transverse series of spots ... 12 *Munionga*, female.

Hindwings beneath dull reddish - fuscous; markings creamy-white, comprising 2 transverse, irregular series of spots ... ... 11 *Mastersi*.

5. Hindwings beneath fuscous, with 10 silvery-white spots arranged in 3 transverse series ... ... 14 *Crypsargyra*.

Hindwings beneath reddish-fuscous, with one large cellular and 3 small sub-median white spots 6

6. Stigma erect, narrow black, interrupted, extending to below vein 1 ... ... 16 *Dirphia*.

Stigma black, thick, curved, edged broadly posteriorly with dull fuscous 7

7. Hindwings beneath bright ochreous, with transverse, twice sinuate, silvery-whitish sub-median fascia... 18 *Drachmophora*.

Hindwings beneath reddish-fuscous, markings fuscous, dot-like 8

8. Forewings with stigma, narrow, black, erect, reaching inner margin ... ... 21 *Donnysa*.

Forewings with stigma, ovoid, blotch-like, black, not near reaching inner margin ... 26 *Flammeata*.

9. Forewings above with two additional white spots, beyond subcostal series ... ... 22 *Chaostola*.

Forewings above without such spots 10

10. Forewings above with cellular spot curved upwards at extremity; hindwings with orange median patch above 23 *Andersoni.*
Forewings above with similar markings; hindwings without markings above ... 29 *Doubledayi.*

11. Wings strongly suffused with purplish above; markings yellow ... ... 26 *Flammeata*, female.
Wings fuscous above, markings white 12

12. Forewings above with 2 additional moderate white spots joining subcostal series; patch on hindwings dull white ... ... 28 *Atralba.*
Forewings similarly marked; patch of hindwings orange... 10

13. Forewings above with cellular spot ovoid, golden-yellow, occupying one-third of cell 24 *Dispar.*
Forewings above with cellular spot very small, whitish, transverse 14

14. Forewings with stigma dull whitish, entire, blackish edged, reaching inner margin, cellular spot narrow... 31 *Ismene*
Forewings with stigma similar; cellular spot absent ... 18

15. Forewings with stigma black, very oblique, broadly-lanceolate, not reaching inner margin; cellular spot elongate whitish ... ... 33 *Perronii.*
Forewings with similar stigma, but less oblique; cellular spot absent ... ... 38 *Crypsigramma.*

16. Hindwings above with transverse series of 4 whitish spots ... ... 34 *Compacta*, male.
Hindwings above without such spots ... ... 34 *Compacta*, female.

17. Forewings above fuscous, with upper half of cellular spot, strongly excised and becoming 8-shaped ... ... 33 *Perronii*, female
Forewings above light fuscous; cellular spot narrow, hardly constricted above ... ... 31 *Ismene*, female.
18. Forewings above without markings, except whitish stigma ... ... 39 *Bathrophora*, male.
Forewings above with cellular spot absent ... ... 39 *Bathrophora*, female
19. Stigma narrow, erect, black, somewhat waved, not interrupted; patch of hindwings above bright orange ... 15 *Chrysotricha*.
Stigma similar, broken into 4 spots; patch of hindwings dull fuscous 6
20. Hindwings beneath reddish, spots placed as in *Dirphia*... 19
Hindwings beneath purplish, fuscous without markings or faintly indicated 21
21. Forewings with stigma, narrow, curved, white ... ... 30 *Leucostigma*.
Forewings with stigma, moderately broad, oblique, dull grey-whitish 14
22. Hindwings above with two whitish median spots; forewing with cellular spot quadrate ... ... 19 *Monticolæ*.
Hindwings above with two somewhat hyaline spots; forewing with cellular spot sickle-shaped ... .. 36 *Croceus*.
23. Under side of hindwings fleshy-ochreous, with curved series of rather large white fuscous-edged spots ... ... 20 *Cyclospila*.
Under side of hindwings reddish-ochreous, with 3 or 4 indistinct fuscous dots ... 25

24. Forewings with stigma, waved, narrow, entire, black; lower sub-apical spot sometimes absent	32	*Sexguttata.*
Forewings with stigma narrow, entire, reddish; sub-apical spots present	27	
25. Forewings above with all markings absent, except ovoid black stigma	27	*Tymbophora.*
Forewings above with all markings present, stigma broken into 3 small spots... ...	16	
26. Hindwings above with very large bright orange triangular patch in middle ...	25	*Idothea.*
Hindwings above with very narrow transverse orange median band	5	
27. Hindwings above with three white spots; one in cell, two sub-median	35	*Senta.*
Hindwings above with one whitish spot in cell ...	6	
28. Under side of hindwings yellowish without markings; cilia chequered	37	*Xanthomera.*
Under side of hindwings dull ochreous without markings; cilia fuscous...	33	

This is the dominant genus in Australia, and likely to be much increased. (We have 3 species unnamed, which are probably new, but not in a fit condition for description.) The female specimens bear considerable resemblance to species of the genus *Trapezites*, *Hüb*; but the male are easily distinguished by the stigma, which, although showing considerable variation, is always present. This character separates it from *Trapezites*.

9. Telesto perornata, Kirby.

(*Hesperilla perornata*, *Kirby*. Ann. Mag. N.H., vi., p. 437, 1893; *A. and S.*, Vict. Butt., p. 121, 1893.)

Female, 36 mm. Head, thorax, palpi, antennæ, and abdomen dark fuscous, head and thorax mixed with golden-ochreous hairs, palpi beneath ochreous-whitish, thorax yellowish hairs

beneath, antennæ mixed with ochreous on basal half, abdomen with broad whitish segmental rings, anal tuft ochreous. Forewings elongate, triangular, costa gently arched at base, thence straight, termen oblique, gently bowed; golden-fuscous; markings shining golden-ochreous; basal hairs golden-ochreous; a large rounded orange spot in posterior end of cell, sometimes irregularly mixed with fuscous anteriorly; an elongate, quadrate spot above inner margin, slightly beyond one-third from base; an irregular triangular-shaped spot above inner margin before anal angle, sometimes constricted anteriorly; an oblique transverse row of 3 confluent sub-costal spots at three-fourths from base; a moderate quadrate spot above and slightly beyond second inner marginal spot; a narrower and slightly more elongate spot immediately above quadrate spot, only separated obscurely by dividing vein; cilia whitish ochreous, chequered with blackish. Hindwings with termen irregularly rounded; color as forewings, but somewhat darker; a broad curved median orange band, anterior edge encircling cell, posterior edge more or less obscurely crenulate; cilia as in forewings. Under side of forewings dull fuscous, all markings of upper side reproduced; a transverse row of 4 confluent spots along upper half of termen to apex, posteriorly emarginate; cilia as above. Hindwings beneath yellow-whitish; markings black; a spot at base; an elongate spot on costa in middle; a second, smaller, immediately below; a third, cartridge-shaped, very large and occupying whole of cell, except an elongate median streak of ground color; a fourth, moderate, immediately below; an irregular spot just before apex, followed at its anterior and posterior extremities by a row of 5 spots, those along termen being the smaller; inner margin broadly fuscous; cilia as in forewings.

Closely allied to the following; best distinguished by its comparatively large size, narrower band of upper side of hindwings, and special markings of under side of forewings.

The larvæ feed on *Cladium*, and are pale yellowish-green, markings hardly traceable. The pupæ are blackish and have two blunt projections on forehead.,

Sydney, New South Wales; Victoria; four specimens in March.

10. Telesto ornata, Leach.

(*Hesperilla ornata, Leach*, Zool. Misc. I., p. 126, t. 55, figs. 4, 5, 1815; *Math.* Trans. Ent. Soc., p. 185, t. 6, figs. 9, 9a, 1888; *A. and S.* Vict. Butt., p. 120, 1893.)

Male and female, 28-34 mm. Head and palpi blackish, spotted

with ochreous, palpi ochreous beneath, collar orange. Thorax and abdomen dark fuscous, thorax clothed with ochreous hairs, and clothed with white beneath, abdomen with whitish-ochreous segmental rings, anal tuft black, mixed with white. Antennæ black, sharply annulated with white beneath, club whitish beneath. Legs whitish-ochreous, tibiæ and tarsi blackish. Forewings elongate, triangular, costa nearly straight, termen nearly straight, oblique in male, rounded in female; dark golden-fuscous, somewhat shining; basal hairs yellowish; markings golden-ochreous; a large quadrate spot in posterior end of cell, somewhat sinuate in male anteriorly; stigma black, erect, narrow, sometimes broken into two spots, from above inner margin at two-thirds to lower extremity of termination of cell, where it is broadest; a moderate cartridge-shaped spot immediately beyond end of cell, in male much smaller; a quadrate spot immediately below, in male very small, only separated from preceding spot by intervening vein; an oblique transverse row of 3 elongate sub-costal spots at two-thirds from base, upper smallest; cilia yellowish, barred with fuscous. Hindwings with hind-margin somewhat prominent toward anal angle; dark fuscous, darker than forewings; basal hairs yellowish; a moderately broad transverse orange median band, upper extremity encircling termination of cell and continued as a quadrate spot towards inner margin, posterior edge somewhat crenulate, becoming elongate on outer edge, but not near reaching termen; cilia as in forewings. Under side of forewings dark fuscous, spots of upper side reproduced, but less distinct, cellular spot surmounted by an elongate cuneiform whitish spot, somewhat suffused; a moderately broad transverse whitish band, from just before apex and slightly curved round to near upper extremity of spot following stigma, broadest beneath, emitting from its anterior edge of upper-half whitish streaks to the 3 sub-costal spots and enclosing 3 ovoid spots of ground color, and enclosing on edge of termen 4 nearly similar spots of ground color, upper largest, third obscure; a dull, in female bright, somewhat quadrate whitish spot on vein 1 at two-thirds from base; cilia as above, but more distinctly barred. Hindwings pale whitish-ochreous, markings black; a round spot on costa at base; an elongate spot on costa before middle; a similar smaller sub-costal spot beyond middle; a large pyriform spot in cell, centred with ground color; a rounded spot beneath first elongate spot, a second below second sub-costal spot, and a third at apex; a row of 5 spots along termen, quadrate, upper smallest, followed above by a row of 4 parallel more elongate spots, sometimes median

pair and more or less confluent with those on termen; a large cuneiform spot at base, below cell; inner margin broadly fuscous; cilia as in forewings, somewhat reddish tinged at base of black bars.

Closely allied to the preceding, but immediately distinguished from that species by the narrower and different shape of orange band of hindwings and smaller markings. The male is subject to slight variation in the development of the post-stigmal dot, which in some specimens is very suffused.

Larva full fed, 30 mm. Moderate, cylindrical, somewhat wrinkled, with hardly perceptible short whitish hairs, those on posterior segments being longer. Head pale ochreous-fuscous, with a fine reddish median stripe, becoming V-shaped on forehead, and a fuscous-reddish spot on either side of mouth. Body yellowish-fuscous, markings fuscous, faintly indicated; dorsal well developed, sub-dorsal and lateral similar, but more conspicuous on segments 9-13; spiracular and sub-spiracular hardly traceable; supra-spiracular ochreous whitish; full fed in October; imago emerges during October and November. Feeds on *Cladium asperum*. The pupæ are fuscous, and are furnished with two long hornlike projections on anterior segment. The pupal stage is of very short duration.

Sydney, Newcastle, and Bathurst, New South Wales; Jindwick, Leongatha, and Wandin, Victoria; Cooktown and Mackay, Queensland; October to January, five specimens.

11. Telesto mastersi, Waterh.

(*Hesperilla Mastersi*, *Waterhouse*. Proc. Linn. Soc., N.S.W., p. 54, 1900, pl. 1, figs. 5-8.)

Male and female, 40-46 mm. Head fuscous. Palpi yellowish-white. Antennæ and legs fuscous, antennæ annulated beneath with whitish, club reddish beneath. Thorax and abdomen above blackish, with yellowish segmental rings. Forewings elongate, triangular, costa almost straight, termen oblique; dark golden fuscous; basal hairs orange yellow; markings ochreous-yellow, hyaline; a large quadrate spot in posterior end of cell, in female indented anteriorly and posteriorly; a second, moderate, beyond extremity of cell; in female there are 2 similar spots immediately below the second, the upper large, quadrate, the lower somewhat elongate; an oblique transverse series of 3 small sub-costal spots at two-thirds from base; a small spot in female at one-third from base; stigma black, moderate, entire from beyond middle of inner margin to beyond lower termination of cell; cilia fus-

cous, chequered with ochreous-white. Hindwings with termen rounded in female, anal angle in male somewhat prominent; color as in forewings, but somewhat darker; basal hairs yellow; a large, broad orange-yellow transverse median patch, somewhat narrowed in male, not near reaching costa or inner margin, upper edge irregular, posterior hardly straight; cilia as in forewings. Under side of forewings dark fuscous, lighter towards apical third; markings of upper side, except stigma, reproduced; costa yellowish-white, spotted with fuscous on posterior half; inner margin yellowish-white, broadest in middle; cilia as above, but more pronounced. Hindwings reddish-fuscous; markings ochreous-white; basal third of costa ochreous-white; a moderately broad band from costa near apex to middle of inner margin, separated into four spots, first and second confluent extending to middle of disc, third and fourth elongate, fourth on inner margin; a black spot in band near costa; a parallel band of about 3 or 4 roundish spots from inner margin above anal angle to below apex; cilia as in forewings.

Allied to *Ornata*, but the lesser number of spots of forewings, and especially by the arrangement of the markings of under side of hindwings, this species is at once recognised; it is the finest yet described.

Clifton and Mount Kembla, Illawarra, New South Wales; taken by Mr. A. G. Hamilton and G. A. Waterhouse, in January.

12. Telesto munionga, Oll.

(*Hesperilla munionga, Olliff*. Proc. Linn. Soc., New South Wales. Ser. 2, iv., p. 623, 1889.)

Female, 29-35 mm. Head, thorax, and abdomen dark fuscous, segmental margins of abdomen yellowish, more distinct beneath. Antennæ and palpi blackish, antennæ annulated with yellow beneath, palpi whitish beneath. Legs ochreous. Forewings elongate, triangular, costa nearly straight, faintly sinuate in middle; dark fuscous-golden; basal hairs yellowish, not very dense; markings orange; a large somewhat cuneiform spot in posterior end of cell, narrowed beneath; a second, cartridge-shaped, beyond termination of cell, lying between veins 2 and 3; a third, quadrate, immediately below, only separated by intervening vein; a small spot above inner margin at two-thirds from base; a transverse series of 3 elongate sub-costal spots at two-thirds from base; cilia dark fuscous, broadly chequered with orange. Hindwings with termen rounded; color as in forewings; a rather short, narrow, orange median band at end

of cell, not near reaching margins; cilia as in forewings. Underside: Forewings dark fuscous; markings of upper side suffusedly reproduced; anterior half of cell blackish; a moderately thick yellow costal streak from base to apex, at apex becoming blotch-like and extending to above middle of termen, within the blotch are 3 elongate blackish spots just beyond the 3 yellow sub-costal spots, and a series of 4 round blackish spots along termen; cilia as above. Hindwings yellow with blackish markings; 2 roundish spots at base; 3 transverse series of elongate spots, first before, starting from a very elongate spot on costa, to before middle of inner margin; second from beyond middle of costa to beyond middle of inner margin; third along termen, the latter series being roundish; cilia as in forewings.

The bright orange yellow markings of under side of hindwings in contradistinction to the other similarly marked species makes this species easy of recognition.

Mount Kosciusko, New South Wales; one specimen.

13. Telesto picta, Leach.

(*Hesperilla picta, Leach.* Zool. Misc. I., p. 126, t. 55, f. 4, 5, 1815; *Math.* Trans. Ent. Soc., Lond., p. 187, 1888; *A. and S.*, Vict. Butt., p. 121, 1893.)

Male and female, 32-38 mm. Head, palpi, thorax, antennæ, and abdomen dark fuscous, palpi strongly mixed with whitish beneath, thorax and abdomen clothed with short, fine yellowish hairs, abdominal segments more or less outlined with yellow, antennæ annulated with whitish beneath. Legs ochreous, mixed with fuscous and whitish. Forewings elongate, triangular, termen gently bowed, oblique; dark golden-fuscous, basal hairs yellowish; markings golden-ochreous; a large somewhat rounded spot in posterior end of cell, anterior edge with a slight projection in middle, posterior edge faintly indented in middle; stigma erect, waved, entire, narrow, from vein 1 above inner margin at two-thirds to beyond lower extremity of cell; a somewhat quadrate spot touching apex of stigma; another spot, larger, just below, only separated by dividing vein; a moderate suffused spot above inner margin at two-thirds from base, most distinct on under side; a similar spot at one-third from base; an oblique transverse series of 3 small sub-costal spots at two-thirds from base; cilia dark fuscous. Hindwings with termen rounded, anal angle somewhat prominent in male; dark fuscous; basal hairs ochreous-fuscous; extending to median band and along inner margin;

a narrow median orange transverse band, constricted posteriorly and not reaching inner margin, upper edge encircling posterior extremity of cell; cilia orange, chequered with black. Under side of forewings dark reddish-fuscous, markings of upper side, except stigma, reproduced; a series of 4 or 5 white lunate spots along apical third of termen; a very fine interrupted whitish line along termen; cilia as above. Under side of hindwings reddish-fuscous; all veins outlined with whitish ochreous; a whitish-ochreous moderately thick transverse band from just before apex to above middle of inner margin, hardly reaching inner margin; a fine crenulate parallel sub-terminal whitish line, from apex to vein 1, becoming blotch-like at extremity; a fine whitish line along termen; cilia as above.

Easily recognised from its allies by the markings of under side of hindwings and outlining of veins.

Mr. G. F. Matthew found the larvæ feeding upon *Cladium mariscus*, and states they are of the usual skipper shape, pale transparent olive in color, having the head sienna red, with a V-shaped mark on face. Mr. Waterhouse states that he has bred it from larvæ feeding on *C. asperum*, and that the larvæ and pupæ are almost identical in appearance with *Ornata*.

Sydney and Bathurst, New South Wales; Croajingalong, Victoria; from January to April.

14. Telesto crypsargyra, Meyr.

(Proc. Linn. Soc., N.S.W., ser. ii., p. 829, 1887.)

Male and female, 25-29 mm. Head black, spotted with pale yellow. Palpi pale yellow, apex black. Antennæ black, beneath spotted with pale yellow. Thorax fuscous, clothed with yellow hairs. Abdomen black, segmental margins pale yellow. Forewings elongate, triangular, costa nearly straight, termen rounded, slightly oblique; dark fuscous; basal hairs yellowish; spots light ochreous-yellowish, somewhat hyaline; first moderate, irregular, in middle of disc; 3 very small, sub-confluent, in an oblique transverse row beneath costa at three-fourths; one small sub-quadrate, between veins 3 and 4 at base, beneath which in male is a minute dot; in female a rather larger adjacent similar spot; stigma erect, black, from disc beyond middle to two-thirds of inner margin; in female a small yellow spot near inner margin before middle, and a larger one at two-thirds; cilia fuscous, terminal half sometimes obscurely spotted with pale yellow. Hindwings with termen rounded; blackish-fuscous; a mode-

rate transverse fascia like band in middle of disc, narrowed and less defined beneath, not nearly reaching margins; cilia blackish, more or less chequered with yellow. Under side of forewings dark fuscous; markings of upper side, except stigma reproduced; a yellowish suffusion beneath costa on basal half; a small yellow spot on costa at four-fifths; a yellow bar before termen, from costa to vein 4; an interrupted line along termen. Hindwings beneath fuscous-ferruginous; veins partly outlined with yellowish; an oblique pale yellowish blotch from costa near base; ten snow-white spots, arranged as follows: First small, beneath middle of costa; second longitudinal-linear, in disc before middle; third cuneiform, irregular, beneath disc, before middle; fourth moderately large, trapezoidal, in middle of disc; fifth sub-oval, beneath costa before apex; remaining five rather small, forming a sub-marginal series, 2 upper smallest and sometimes confluent.

Very distinct and handsome; easily known by the spots of under side of hindwings.

The larva when full fed is similar in markings and appearance to *Picta* and *Ornata*, but smaller and somewhat blue-green in appearance and deeper in tone than either of the above species. It feeds on a specis of *Cladium*, and is full fed in November. The pupa is similar to *Ornata*, and is furnished with appendages as in that species.

Blackheath and Katoomba, New South Wales, from November to February.

15. TELESTO CHRYSOTRICHA, n. sp.

Male, 40 mm. Head, palpi, thorax, antennæ, legs and abdomen ochreous-fuscous, palpi beneath ochreous-whitish, head, thorax, and abdomen clothed with yellowish hairs. Forewings elongate, triangular, termen nearly straight, oblique; dark fuscous, with yellowish markings; basal hairs orange; a large quadrate spot in posterior extremity of cell, indented anteriorly and posteriorly; a cartridge-shaped spot at base of veins 3 and 4, a smaller one immediately below, and an oblique transverse series of three sub-apical spots; stigma black, waved, moderate, erect, from above inner margin beyond middle to base of veins 3 and 4; cilia fuscous, darker at base. Hindwings with termen rounded, color as in forewings; basal and inner marginal hairs orange; a large median patch of orange scales, somewhat divided by intervening veins; cilia yellowish.

Under side of forewings reddish-ochreous; markings of upper side reproduced; basal two-thirds of cell orange, dorsal area

pale yellow on posterior half more or less edged above by its own width of pale yellow; spot between veins 2 and 3 much enlarged, and pale yellow. Hindwings reddish; markings silvery-white, edged with fuscous; a round spot in posterior extremity of cell; a similar spot at two-thirds from base, between veins 6 and 7, and two similar between veins 2 and 4; dorsal area pale yellowish; cilia as above.

Allied to *Dirphia*, Hew., but separable by the different coloring of hindwings above and below, in other respects similar.

Northampton and Albany, Western Australia; two specimens in November.

? 16. TELESTO DIRPHIA, Hew.

(*Hesperilla dirphia, Hew.* Desc. Hesp., p. 38, n. 2, 1868; male, *H. trimaculata, Tepp.* Trans. Roy. Soc., S.A., iv., p. 32, t. 2, fig. 4, 1881; female, *H. quadrimaculata, ib. l.c.*, fig. 2.)

Male and female, 35-47 mm. Head, palpi, thorax, antennæ, and abdomen dark golden-fuscous, palpi yellowish beneath, thorax clothed with long yellowish hairs, antennæ annulated with whitish, club reddish-fuscous, internally whitish. Legs fuscous. Forewings elongate, triangular, costa nearly straight, faintly sinuate in middle, termen hardly round, oblique; dark golden-fuscous, with whitish-ochreous markings; a large, somewhat quadrate spot in posterior end of cell, edges sinuate; a quadrate spot beyond end of cell, near base of veins 3 and 4; in female a similar spot immediately below; a moderate quadrate spot lying on vein 1 and three-fourths from base, absent in male; an oblique transverse row of 3 quadrate subcostal spots at two-thirds from base; stigma black, narrow, erect, somewhat broken into 5 spots, from above inner margin beyond middle to beyond posterior extremity of cell; cilia dark fuscous. Hindwings with termen rounded, color as in forewings; basal half of wing clothed with long dull yellowish hairs; a round yellow spot in cell near posterior extremity; cilia ochreous-fuscous. Underside of forewings ochreous-fuscous, median third of wing dark fuscous, markings of upper side reproduced, except stigma and upper and lower of sub-costal spots; in the male are 2 extra spots placed as in male; cilia as above. Under side of hindwings reddish-ochreous; markings snow-white, edged with blackish; a large roundish spot in end of cell; a second in disc at two-thirds and 2 others, much smaller, contiguous to, and below second; cilia ochreous-fuscous, around inner margin fleshy.

Readily known by the white spots of under side of forewings; in some female specimens the cellular spot of upper side of hindwings is absent.

Blackwood, Belair, and Port Victor, South Australia; Grampians, Victoria; Perth, Western Australian (*S. Angel*); Katoomba and Sydney, New South Wales; in October and November. Mr. Miskin records it from Cape York, Queensland, so that it would appear to have a very wide range.

Larva full fed, 44 mm. Moderately stout, cylindrical, nearly smooth, clothed with short, hardly perceptible whitish hairs, those on anal segment being more dense, longer, and fuscous tinged. Head rugose, black; body yellowish-green, three anal segments mixed with fleshy-pink, dorsal line well developed, moderate, greenish, becoming obscured anteriorly; spiracular, sub-spiracular, and supra-spiracular hardly traceable, spiracles small, fuscous. Full fed in October; feeds on *Lepidospermum concavum*. The pupa is cylindrical, with two large, short, somewhat rose-shaped projections on anterior segment. Imago emerges from early in October to December.

17. Telesto dominula, Plotz.

(*Telesto dominula, Plotz*, Stett. Ent. Zeit. xlv., p. 379, 1884.)

"16 mm (measurement of one wing only). Hindwings above unspotted. The typical spots are white. In male forewings only with the apical dots; a narrow transverse spot in the cell, and a small spot in cell 3; a strong black and grey stigma runs from vein 1 to the angle of cell 3, almost transverse and bent towards termen. Hindwings beneath fuscous; a dirty white pear-shaped spot stands in the cell towards base, behind the middle runs a similar-colored waved band, cut by the dark veins, from cell 1c to cell 6; in cell 7 stands a separate spot, and one towards termen in cell 5. In cell 1c the band sends a light streak to base, dilated towards the extremity." The above is translated from Plotz's original description, and would indicate a species very similar to *Drachmophora*, Meyr., in appearance.

"Tasmania."

18. Telesto drachmophora, Meyr.

(Ent. Mo. Mag., p. 82, 1885.)

Male and female, 27-30 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, palpi whitish-yellow beneath, thorax clothed above with greenish-yellow hairs, beneath whitish, abdominal segments whitish beneath. Legs fuscous.

Forewings elongate, triangular, costa straight, termen rounded, oblique; dark golden-fuscous; markings ochreous-white; a small elongate spot in posterior end of cell; a second, roundish, between veins 3 and 4, near base; a third, larger, just below and beyond, absent in male; a fourth, resting on vein 1 at two-thirds from base; an oblique transverse series of 3 sub-costal quadrate spots at three-fourths from base; stigma short, obliquely curved, from inner margin above vein 1 to beyond posterior extremity of cell, edged posteriorly by 3 very dull ochreous-fuscous spots; cilia fuscous, barred with dull ochreous. Hindwings with termen rounded; color as in forewings; basal half of wings clothed with long ochreous hairs, becoming orange along upper margin of cell; cilia as in forewings. Underside of forewings dark fuscous, costa throughout, broadly orange; markings except stigma and accompanying spots as on upper side; 3 or 4 suffused whitish spots along upper half of termen; cilia as above, but more pronounced. Underside of hindwings golden fulvous, becoming darker on margins; an irregular silvery-white spot at about one-third from base; a second, elongate, lying on vein 1 near base; a moderately broad irregularly edged, waved transverse silvery-white fascia, from just beneath costa beyond middle to vein 1 above anal angle, strongly sinuate on vein 6, brightest and broadest between veins 2 and 4; a row of suffused whitish spots above termen; inner margin yellowish; cilia as in forewings.

A very beautiful species on the under side; easily known by the curious form of the stigma and transverse fascia of under side of hindwings.

Somewhat similar in appearance beneath to *Dominula*, Plotz.

Deloraine, Tasmania; Moonbar, New South Wales; in March (and probably February).

19. Telesto monticolæ, Oll.

(*Hesperilla monticolæ, Oll.* Proc. Linn. Soc., New South Wales, iv., p. 624, 1889).

Male, 24-25 mm. Head, thorax, palpi, and abdomen dark fuscous, palpi whitish beneath. Antennæ fuscous, spotted with whitish beneath. Forewings elongate, triangular, termen gently bowed, oblique; dark fuscous; three white spots; first sub-costal near apex, divided into three parts by veins; second in cell at posterior extremity; somewhat quadrate; third large just beyond and below lower angle of cell; a fourth spot just below third; stigma, black, moderately erect, slightly

waved, from above inner margin beyond middle to base of lower angle of cell; cilia ochreous-white, barred with fuscous-ochreous. Hindwings with termen rounded; color as in forewings; a white median spot, divided into two parts by bisecting vein; cilia as in forewings. Under side of both wings greyish-fuscous, somewhat ochreous tinged, forewings with ochreous basal hairs; markings as above; a whitish streak along upper half of termen. Hindwings with broad longitudinal bars of whitish, one in middle extending from base to termen, very conspicuous, and interrupted before extremity of cell where there is a fuscous spot, and again at about midway between cell and termen; an indistinct white bar near costa; a third near inner margin, both interrupted by a suffused fuscous spot at about two-thirds from base.

Somewhat like *Trapezites gracilis*, Tep., but the stigma forms a definite character.

Type in Australian Museum, Sydney; taken at Moonbar, New South Wales; two specimens in March.

20. Telesto cyclospila, n. sp.

Male and female, 33-38 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, thorax clothed with golden-ochreous hairs, antennæ spotted with white beneath, club reddish above, palpi beneath whitish. Forewings elongate, triangular, costa faintly sinuate in middle, termen gently bowed; golden-ochreous, somewhat shining, basal third clothed with short yellowish hairs; markings golden, except sub-costal spots which are whitish; a large quadrate spot in posterior end of cell, indented above middle on anterior and posterior edges; stigma black, erect, slightly waved, but not broken into spots, gently curved inwards above inner margin, from two-thirds inner margin to base of veins 3 and 4; a moderate cartridge-shaped spot touching upper extremity of stigma; a similar smaller spot just below; an oblique transverse series of three whitish sub-costal spots at three-fourths from base; cilia dull whitish, basal half fuscous. Hindwings with termen rounded; basal hairs orange, extending to middle; an elongate-quadrate orange patch below cell in middle of wing; some orange scales below; cilia as in forewings. Underside of forewings dull fleshy-ochreous; wing below cell fuscous, except above anal angle, which is pale yellowish; markings of upper side, except stigma, reproduced; sub-costal spots edged posteriorly with dark fuscous; upper margin of cell orange; an oblique series of 3 spots below post-cellular cartridge-shaped

spot, first moderate, quadrate, somewhat projecting anteriorly; second smaller, about half size of first; third elongate and reaching termen, rounded anteriorly; cilia as above. Hindwings fleshy-ochreous, markings white, edged with fuscous; a round spot at end of cell; a curved series of 7 spots; first elongate, below costa at just before two-thirds; second, largest, immediately below and beyond; third and fourth small; fifth and sixth moderate; seventh small, last 5 parallel to termen; inner marginal area broadly pale yellowish; cilia as above.

Allied to *Donnysa*, Hew., but separated by the fewer number of spots of upper side, and especially by the totally different color and markings of under side of hindwings, which in that species is lilacine and the spots are very small and differently placed.

Port Lincoln, South Australia; Melbourne, Victoria; two specimens in November.

21. Telesto donnysa, Hew.

(*Hesperilla donnysa, Hew.* Male. Desc. Hesp., p. 39, n. 3, 1868; Butt. v. Hesp. and Cyclop, fig. 7, 1874; *A. and S.*, Vict. Butt., p. 102, 1893.)

Male and female, 33-40 mm. Head, palpi, antennæ, thorax, and abdomen dark golden-fuscous, palpi and thorax whitish beneath, thorax and abdomen clothed with yellowish hairs above, antennæ spotted with white beneath. Legs reddish-fuscous. Forewings elongate, triangular, costa almost straight, termen hardly rounded, oblique; dark golden-fuscous markings yellowish; a moderately large elongate-quadrate spot in posterior end of cell, anterior and posterior edges sinuate; a second, somewhat rounded, between veins 3 and 4 near base; a third, larger, just below second; a somewhat ovate spot above inner margin at two-thirds from base, absent in male, or faintly traceable; an oblique transverse series of 3 sub-costal spots at three-fourths from base; stigma, black, narrow, oblique, somewhat broken into spots from immediately above inner margin to base of vein 4; cilia golden-fuscous. Hindwings with termen rounded; color as in forewings; basal and inner marginal hairs long, orange; a moderate dull orange band in middle of wing, divided into 3 spots by intervening veins, upper spot quadrate, well developed, lower two obscure; cilia ochreous, with fuscous spots at extremities of veins. Under side of forewings dull fuscous, median third dark fuscous; inner margin light ochreous; markings of upper side, except stigma, reproduced; a suffused yellowish spot resting on vein 1 at two-

thirds from base; cilia as above. Hindwings beneath pale fleshy lilac, with 7 fuscous spots; sometimes centred with whitish; first in cell near posterior extremity; second considerably beneath costa, at two-thirds from base; the remaining 5 in a transverse row at two-thirds from base, and almost parallel to termen; inner margin broadly dull ochreous, gradually attenuated from base; cilia as in forewings.

This species, although subject to slight variation in the development of the spots of under side of forewings, may be recognised by the narrow sexual band and small orange patch on hindwings.

The larvæ, which feed on species of *Cladium*, are when full fed about 35 mm. in length, head oblong and large, greenish-brown with a conspicuous V-shaped mark, apex pointing towards the body; there are also brownish markings on the sides; the body is cylindrical, tapering slightly towards anal extremity, uniform dull green, slightly wrinkled and paler at each segment; a dark green dorsal line; anal flap punctuated with minute bristles. The chrysalis is moderately long, with rugose projection on anterior segment. Found between united leaves or stems, the larva first spinning a circular silken pad about an inch above, which prevents the leaves contracting and enclosing the insects; the larvæ are full fed in November, the pupal state lasting about a fortnight.

Ringwood, Victoria; Scottsdale and Deloraine, Tasmania; Katoomba and Sydney, New South Wales; Blackwood and Port Lincoln, South Australia; from November to January.

22. Telesto chaostola, Meyr.

(Trans. Linn. Soc., New South Wales, ii., p. 830, 1887.)

Male, 34 mm. Head, palpi, thorax and abdomen fuscous grey, palpi becoming whitish beneath, hairs of abdomen yellowish tinged. Antennæ black, annulated with white. Forewings elongate-triangular, costa nearly straight, termen rounded, somewhat oblique; dark ochreous-fuscous; basal hairs yellowish; a slender ochreous-whitish line immediately beneath costal edge on basal half (sometimes absent); spots light ochreous yellowish, thinly scaled; one in middle of disc, moderately large, sub-quadrate; a second, smaller and sub-oval, near beyond this in middle; 3 very small, adjacent, arranged in a transverse series beneath costa at three-fourths; 2 other similar spots obliquely beneath and beyond these; a black stigma from beyond first discal dot to three-fifths of inner margin; cilia grey-whitish, barred with fuscous, basal third

fuscous. Hindwings with termen rounded; dark fuscous; basal hairs yellowish; a longitudinal oblong ochreous-yellow blotch in middle of disc, surmounted by 3 or 4 cloudy yellowish spots touching it; cilia whitish, basal third dark fuscous.

Underside: Forewings dark fuscous, paler along inner margin, spots of upper side reproduced, but lighter in color; a triangular orange blotch extending beneath costa from near base to first spot; three additional yellowish spots beneath second discal spots, forming with it a transverse series; a cloudy grey-whitish patch along upper half of termen, narrowed at extremities and edged with dull purplish. Hindwings purplish fuscous, irregularly sprinkled with grey-whitish, dorsal half more grey-whitish, excepting near termen; a twice dentate dark purplish mark towards inner margin before middle; 8 indistinct moderate spots outlined with dark fuscous, one before and above middle, one smaller in middle, remaining 6 forming a series (lower 3 adjacent) parallel to termen at two-thirds; a series of obscure fuscous dots beyond.

Female, 36 mm. Color and markings as in male excepting stigma, the single post-cellular spot is somewhat more flattened than in male, and immediately below it are 2 rather larger spots, first sub-quadrate, second irregular cuneiform.

Allied to the preceding species, but very distinct by the larger number of spots on forewings, besides other differences.

Blackheath, New South Wales; one male specimen taken by Mr. G. H. Raynor in November; Huonville, Tasmania; one female specimen taken by Mr. J. R. Norman in December.

23. Telesto andersoni, Kirby.

(Ann. Mag., N.H., vi., p. 434, 1893; *A. and S.*, Vict. Butt., p. 118, 1893.)

Male and female, 28-30 mm. Head, palpi, thorax, antennæ, and abdomen dark ochreous-fuscous, palpi beneath ochreous-whitish, antennæ annulated with whitish beneath, club reddish. Legs ochreous-fuscous. Forewings elongate-triangular, costa nearly straight, slightly arched near base, especially female, termen oblique, gently rounded; dark golden-fuscous, with yellowish markings; basal hairs orange; a large elongate spot in cell, occupying posterior half, strongly sinuate above; two somewhat quadrate spots beyond end of cell, upper largest; an erect, moderate black stigma, from immediately before last mentioned spots to inner margin at two-thirds; an oblique series of 3 sub-apical spots beyond three-fourths of costa; cilia dark fuscous, with a blackish hind-marginal line.

Hindwings with termen rounded; color as in forewings; basal and inner marginal hairs orange; an elongate median patch of yellowish scales, reaching from base to beyond two-thirds of wing, brightest on upper edge; cilia orange yellow.

Underside of wings purplish-fuscous, markings of forewings reproduced, excepting stigma; basal two-thirds of cell filled with orange; markings more or less edged with dark fuscous; cilia as above. Hindwings with two obscure parallel series of transverse fuscous dots in middle, not reaching either margin; cilia dull ochreous, with a few blackish spots at base.

Female, 30-32 mm. Color as in male, but markings of forewings golden-yellow, post cellular pair larger, spot in cell less elongate, patch of yellow on hindwings more pronounced.

This species could at first sight be easily confused with *Chaostola*, Meyr., but the absence of the two extra spots beyond the post-cellular pair is a definite and reliable distinction, besides which *Chaostola* has only one post-cellular spot in the male, but three large ones in the female.

Dandenong Ranges and Poowong, Victoria; in December and January.

24. Telesto dispar, Kirby.

(Ann. Mag., N.H., vi., p. 436, 1893; *Trapezites dispar*, *A. and S.*, Vict. Butt., p. 117, 1893.)

Male, 40 mm. Head, thorax, and abdomen golden-ochreous, more or less clothed with greenish-ochreous hairs; thorax and abdomen beneath clothed with whitish hairs. Palpi blackish. Antennæ black, annulated with white beneath, club reddish-carmine beneath. Legs reddish-fuscous. Forewings elongate-triangular, costa nearly straight, termen gently bowed, oblique; ochreous-fuscous, with somewhat golden reflections; markings golden-metallic; a large elongate-ovate spot in posterior end of cell, somewhat indented in middle above; a moderate, somewhat quadrate spot beyond lower extremity of first spot, sometimes surmounted by 2 or 3 small additional spots, but these are generally absent; stigma narrow, black, more or less broken into 5 or 6 elongate spots, from inner margin at two-thirds, terminating between quadrate and ovate spots; cilia dark fuscous. Hindwings with termen rounded, color as in forewings; base and inner margin clothed with greenish-ochreous hairs; an elongate patch of dull orange in middle of wing, not near reaching termen; cilia reddish-ochreous, mixed with fuscous at base. Under side of forewings reddish-ochreous, upper margin of cell narrowly orange throughout, large cellular spot of upper side reproduced, and

edged posteriorly with blackish, which color is continued obliquely to inner margin and basal area of wing; a large golden-orange quadrate spot between veins 4 and 5; a second, larger, immediately below; a third, somewhat paler and much narrower below second; a very elongate yellowish blotch immediately below, extending to termen; a second, just below, more or less suffused anteriorly; a very small whitish spot between veins 7 and 8, blackish edged; cilia reddish-fuscous, mixed with blackish, darker around inner margin. Hindwings and cilia reddish-ochreous, without markings.

A large and distinct species not nearly approaching any other in general appearance. The species known as *Idothea*, Miskin, is considered by some to be the female of the present species, *vide* Kirby, Ann. Mag., N.H., vi., 436, 1893, which is not improbable, but in the absence of authentic information we prefer to keep them separate at present.

Hobart, Tasmania; Grampians, Wandin, and Macedon, Victoria; in December and January.

25. Telesto idothea, Misk.

(Proc. Roy. Soc., Queensland, p. 152, 1889; *A. and S.*, Vict. Butt., p. 116, 1893.)

Female, 40 mm. Head, palpi, thorax, and abdomen dark fuscous, mixed with greenish-ochreous hairs, whitish-ochreous beneath. Antennæ dark fuscous, annulated with white beneath, club reddish beneath. Legs ochreous. Forewings elongate-triangular, costa gently arched, termen gently bowed, oblique; dark fuscous golden; markings golden, somewhat hyaline; basal hairs orange; a large irregularly quadrate spot in posterior end of cell, anterior edge with a faint tooth in middle, posteriorly slightly indented above middle; a cartridge-shaped post-cellular spot beyond and below, apex almost touching cellular spot; a second, elongate-quadrate immediately below; a third below middle of second, irregular- triangular; a fourth, somewhat ovoid, immediately below third, sometimes joined to third by 2 or 3 golden scales; an oblique transverse series of three quadrate sub-costal spots, lower largest; cilia fuscous, chequered with black. Hindwings with termen hardly waved; dark fuscous inclining to blackish; basal and inner marginal hairs greenish-yellow; a very large somewhat cuneiform patch of orange, from near base to two-thirds of wing, bounded by veins 2 and 6, much dilated posteriorly, posterior edge with 2 semi-circular excavations between veins 2 and 4; cilia reddish-ochreous, chequered with

black at extremities of veins. Under side of both wings reddish-ochreous, dorsal two-thirds of forewings blackish, not reaching inner margin above middle; cellular and first 2 post-cellular spots of upper side, reproduced; sub-costal spots hyaline, somewhat suffused and more or less edged with black; inner margin whitish-ochreous, except basal third, which is blackish; 2 lower post-cellular dots appear as elongate blotches of whitish-ochreous; some orange scales along upper margin of cell; cilia as above. Hindwings with markings black, comprised of 3 small dots, with indications of a fourth; first and second at two-thirds from base, between veins 2 and 4; third between veins 6 and 7 at two-thirds from base; fourth hardly traceable, preceding first; inner margin broadly dull white; cilia as above.

This insect is in all probability the female of the preceding species, a view shared by others than ourselves, but as the question in still in doubt it appears better to await further information before insisting on the point.

It is an attractive and easily recognised species, specially characterised by the large brilliant orange patch of hindwings.

The larva, which is similar to *Trapezites iacchus* in appearance, feeds on *Cladium*. The pupa is blackish, with rugose head.

Katoomba, New South Wales; Wandin and Healesville district, Victoria; two specimens in December.

26. Telesto flammeata, Butler.

(A and M.N.H. (5), ix., p. 85, 1882; *T. eclipsis, Butl., l.c.*, p. 86, male; *Hesperilla atromacula, Misk.*, Proc. Roy. Soc., Queensland, p. 148, 1889.)

Male, 28-34 mm. Head, palpi, thorax, and abdomen dark fuscous, densely clothed with greenish hairs, beneath whitish-ochreous. Antennæ blackish, annulated with whitish, beneath more or less whitish throughout, club reddish above, whitish beneath. Legs dull reddish-ochreous. Forewings elongate-triangular, costa somewhat arched at base, faintly sinuate in middle, termen gently bowed, oblique; golden-ochreous, basal two-thirds of wing more or less clothed with dense orange hairs, somewhat curled in disc; markings yellowish; an irregular elongate spot in posterior end of cell; a second, similar, immediately beyond extremity of cell, between veins 3 and 4, beneath which is a very large rounded patch of velvety black; a small sub-apical spot between veins 6 and 7; a suffused blackish line along termen; cilia ochreous-fuscous, somewhat

chequered with blackish. Hindwings with termen somewhat waved; color as in forewings; base and inner margin more or less clothed with orange hairs; an elongate patch of orange above middle of wing, between veins 4 and 6, not reaching either margin; cilia ochreous. Under side of forewings ochreous, somewhat reddish tinged; costa from base to beyond middle yellowish, markings of upper side reproduced, somewhat hyaline; black patch absent; median third of wing dark fuscous, ground color becoming whitish-ochreous between vein 1 and inner margin; cilia as above. Hindwings with color as in forewings, 2 or 3 small suffused fuscous spots at end of cell; a curved series of about 6 similar spots at two-thirds from base, between veins 1 and 7; cilia as above.

Female, 28 mm. Head, palpi, thorax, and abdomen blackish, more or less clothed with greenish-ochreous hairs, beneath as in male. Legs and antennæ as in male. Forewings as in male, but termen more bowed; ochreous-fuscous, more or less wholly irrorated with purple reflections; basal hairs yellowish wholly irrorated with purple reflections; basal hairs yellowish; markings golden; a large roundish spot in posterior end of cell; a cartridge-shaped spot immediately below and beyond, between veins 3 and 4; a similar, but larger spot immediately below, separated from above by vein 3; an oblique transverse row of 3 sub-costal spots, at about two-thirds from base, lower largest; cilia ochreous, with blackish points at extremities of veins. Hindwings with shape, color, markings, and cilia as in male. Forewings beneath with color as in male; markings of upper side reproduced, but color dull ochreous. Hindwings beneath with color and markings as in male.

An easily recognised species, especially the male. The large black sexual blotch being a conspicuous character.

Healesville, Lake Tyers, Gisborne, Wandin, and Powong, Victoria; Como, New South Wales; in January and February.

27. Telesto tymbophora, n. sp.

Male, 30 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark fuscous, palpi dull whitish beneath, thorax and abdomen more or less clothed with ochreous hairs. Forewings elongate, triangular, termen gently bowed, oblique; dark fuscous, clothed with scattered golden-ochreous hairs; basal hairs ochreous, sparse; a very small hyaline dot at base of veins 6 and 7; stigma large, roundish, just above vein 1 in middle; cilia ochreous. Hindwings with termen faintly sinuate before anal angle; color and cilia as in forewings; basal and inner marginal hairs dull golden-ochreous.

Under side of both wings dull fuscous, more or less sprinkled with yellowish, so as to appear ochreous-fuscous; dot of upper side of forewings reproduced.

A curious and conspicuous species, closely allied to *Flammeata*. We once thought it might be an aberrant form of that species, but having seen several specimens, all similar, we have decided to name it.

Mount Kembla, New South Wales; one specimen taken in December.

28. TELESTO ATRALBA, Tepp.

(*Hesperilla atralba, Tepp.* Trans. Roy. Soc., S.A., iv., p. 33, t. 2, f. 5, 1881; *Telesto dactyliota, Meyr*, Proc. Linn. Soc., N.S.W., p. 831, 1887.)

Male and female, 25-33 mm. Head, palpi, thorax, and abdomen fuscous grey, palpi whitish beneath, hairs of abdomen yellowish tinged. Antennæ black, slenderly annulated with white. Forewings with costa almost straight, termen rounded, almost oblique; rather dark fuscous, in male ochreous shining; basal third clothed with pale ochreous-yellowish hairs; spots pale whitish yellowish, thinly scaled, in male very small, in female moderate; first in middle of disc, transverse; second between veins 3 and 4 at base, roundish, in female with an additional larger spot adjacent to it beneath; three adjacent spots, arranged in a transverse series beneath costa at three-fourths; 2 others obliquely beneath and beyond; stigma in male, strong, blackish, from lower angle of first spot to beyond middle of inner margin; cilia grey-whitish, basal half barred with darker. Hindwings with termen rounded; ground color and cilia as in forewings, dorsal half clothed with pale ochreous yellowish hairs; a pale ochreous-yellowish cloudy longitudinal-oval discal blotch, beneath and beyond which are several very obscure cloudy pale ochreous-yellowish spots, in male tending to form a post-transverse series. Forewings beneath dark fuscous; an obscure, yellowish suffusion beneath costa on basal half; a triangular blotch suffused with whitish grey, occupying apical fourth of wing; spots as above, but in male with an additional spot beneath posterior discal spot, as in female. Hindwings beneath light grey, mixed with fuscous towards costa; spots round, outlined with dark fuscous; a very small one beneath costa at one-third; a similar one in disc before middle; two dot-like, before middle, towards inner margin; seven moderately large spots, placed as an acutely angulated post-median series.

Port Lincoln, Noarlunga, and Moonta, South Australia; Geraldton, Western Australia; in October and November.

29. TELESTO DOUBLEDAYI, Feld.

(Verh. Zool. Bot. Ges., xii., p .491, n. 180, 1862; male, *Hesperilla dirphia*, H.S., *nec.* Hew., Stett. Ent. Zeit,, p. 79, n. 61, Taf. iii., fig. 10, 1869; ? female, *Tel. Leachii, Feld.*, Verh. Zool., Bot. Ges., xii., p. 491, n. 181, 1862; *A. and S.*, Vict. Butt., p. 126, 1893.)

Male and female, 28-30 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, thorax, and abdomen clothed with greenish-yellow hairs, beneath whitish, antennæ spotted beneath with yellowish, club reddish above, whitish beneath. Forewings elongate, triangular, termen bowed, oblique; ochrerous fuscous, with golden reflections; markings yellowish; an elongate spot in cell, extending from beyond middle to posterior extremity, where it is curved to upper edge of cell; much shorter in female; a quadrate spot above and beyond extremity of stigma; a second, smaller, just below, becoming very large in female; an oblique transverse row of 3 whitish spots beyond two-thirds from base; stigma dull fuscous, edged on either side narrowly with black, erect, somewhat waved, from immediately above inner margin at two-thirds to before lower post-cellular spot, cilia fuscous, mixed with whitish. Hindwings with termen hardly waved; color as in forewings; a large patch of dull yellow hairs, extending from base along inner margin to two-thirds, more dense in middle, but not forming definite markings; cilia yellowish, at base fuscous. Under side of forewings purplish-fuscous, markings of upper side reproduced; a moderately broad bluish white marginal streak, extending from middle of termen to apex; inner margin broadly fuscous-whitish throughout, cilia as above. Hindwings beneath purplish-fuscous, irrorated throughout with bluish white, except a submedian band of 5 contiguous moderate fuscous spots; cilia as above.

At once recognised by the rich coloring of under side of hindwings and curious cellular spot of male. We think that the insect figured in "Victorian Butterflies," p. 126, as *Hesperilla arsenia*, Plotz., represents the female of this species, as there are seven spots, not six, on upper side of *Arsenia*, male. There is an excellent figure of the male (figured as *Dirphia*, Hew.) in Stett. Ent. Zeit., taf. iii., fig. 10.

Gympie, Duaringa, Mackay, and Brisbane, Queensland; Como and Sydney, New South Wales; Healesville and Wandin, Victoria; from November to March.

30. TELESTO LEUCOSTIGMA, n. sp.

Male and female, 26-30 mm. Head, palpi, antennæ, thorax, legs, and abdomen golden-fuscous, antennæ faintly spotted with whitish, palpi beneath whitish, hairs of abdomen deep golden-ochreous. Forewings elongate, triangular, termen gently bowed, oblique; dark fuscous, finely sprinkled golden-ochreous; basal hairs golden-ochreous; markings semi-hyaline, faintly ochreous-tinged; a sickle-shaped spot, in female somewhat quadrate, in posterior extremity of cell sometimes almost obsolete in male; a transverse series of three sub-apical spots, sometimes absent in male; a quadrate spot at base of veins 3 and 4, and a smaller one immediately below; stigma white, moderately erect, faintly curved outwards at apex, entire, edged on either with black; cilia ochreous-fuscous. Hindwings with termen rounded; color as in forewings, but without markings; basal and inner marginal hairs long, golden-ochreous; cilia ochreous. Female with color as in male, but markings more yellowish and much enlarged; indications of a small spot on vein 1 beyond middle. Under side of forewings in both sexes fuscous, somewhat purplish tinged, becoming dull ochreous along posterior half of dorsum; markings of upper side except stigma, reproduced. Hindwings more reddish-purplish, with 2 faintly indicated transverse rows of fuscous spots.

Allied to *Doubledayi*, but differs from any other Australian species by the white stigma, which is a very distinctive character; the occasional absence of the sub-apical spots and of cellular spot are curious forms of variation.

Kuranda and Brisbane, Queensland; Mount Kembla, New South Wales; two specimens in October.

31. TELESTO ISMENE, Newm.

(*T. parvulus*, *Plotz.*, Stett. Ent. Zeit., p. 378, 1884; *Telesto ismene*, *Meyr.*, Ent. Mo. Mag., p. 82, 1885; *A. and S.*, Vict. But., p. 128, 1893; *Hesperilla humilis*, Misk, male, P.R. Soc., Queensland, p. 150, 1889.)

Male, 24 mm. Head, palpi, thorax, and abdomen dark fuscous, thorax and abdomen mixed with golden-ochreous hairs, palpi, thorax, and abdomen beneath whitish. Legs ochreous-whitish. Antennæ blackish, annulated with white, club blackish, apex reddish beneath. Forewings elongate-triangular, termen gently bowed; ochreous-fuscous, with golden reflections, basal third more or less clothed with short orange hairs; markings whitish; a narrow, somewhat 8-shaped spot

in posterior end of cell, rarely obsolete; a small roundish spot almost touching apex of stigma; an oblique transverse row of 3 small sub-costal spots, at about two-thirds from base, sometimes edged with fuscous; stigma hyaline, broadly edged with black on either side, from inner margin just beyond middle, somewhat curved outwards so as to nearly touch post-cellular spot, anteriorly twice indented, much constricted below middle; cilia greyish-fuscous, with blackish points at extremities of veins. Hindwings with termen hardly waved; dark fuscous, with golden reflections, hairs on base and inner margin somewhat ochreous; cilia as in forewings. Under side of forewings fulvous, markings of upper side, except stigma, reproduced; a dull whitish patch above anal angle. Hindwings with a transverse sub-median band of about six indistinct contiguous reddish-ochreous spots; cilia as above.

Female, 26-30 mm. With coloring as in male, 8-shaped, post-cellular and sub-costal spots as in male, beneath post-cellular spot is a larger spot, slightly and obliquely beyond; a smaller spot below this, and indications of another beween the two last-mentioned; cilia as in male. Under side of both wings as in male, markings of forewings reproduced, excepting the two spots below second post-cullular spot; transverse band of hindwings more pronounced than in male.

Closely allied to *Doubledayi*, Feld. The male is best distinguished by the cellular spot, which in the present species is somewhat obscured but well developed and large in *Doubledayi*. The female is much more similar, but the additional post-cellular spots and coloring of hindwings are efficient characters to distinguish it from that species.

Healesville, Nar-Nar-Goon, Lake Tyers, Victoria; Brisbane, Mackay, and Duaringa, Queensland.

32. Telesto sexguttata, Herr-Sch.

(Stett. Ent. Zeit., p. 80, n. 64, t. 3, fig. 16, 1869).

Male, 30 mm. Head, thorax, palpi, antennæ, and abdomen golden-ochreous. Forewings elongate-triangular, termen nearly straight, faintly sinuate on lower half; golden-ochreous, markings pale ochreous; a cartridge-shaped spot just above and beyond apex of stigma; a second, much smaller, somewhat triangular, immediately below; a third, more suffused below second, and a fourth, suffused resting on vein 1; an oblique transverse series of 3 (lower one more or less absent) sub-costal spots before apex; second largest; stigma narrow, waved.

oblique, entire, black; commencing at base of vein 5 and terminating on vein 1 near fourth spot; cilia pale ochreous, with a dark line at base. Hindwings with termen faintly waved; color and cilia as in forewings; a few ochreous hairs below cell. Under side of both wings pale ochreous; a broad dull fuscous sub-median streak on forewings; markings of upper side reproduced; a dull whitish elongate patch on inner margin near anal angle; cilia of both wings as above.

Female, 36 mm. Color and markings, except stigma, as in male, but spots larger, the fourth being conspicuous; the third is absent.

An easily recognised species; the absence of the third subcostal spot is curious. A specimen in the Macleay Museum, probably referable to this species, has all the markings of forewings, except stigma, obscured, otherwise similar. Herrich-Schaeffer's figure is accurate; it represents the female.

Bowen, Queensland; two specimens, male and female, in Brisbane Museum collection.

33. Telesto perronii, Latr.

(*Hesperia perronii, Latr.*, Enc. Meth., ix., p. 763, n. 100, 1819; *Tel. perronii, Bdv.*, Voy. Astr. Lep., p. 164, 1832; *T. Kochii, Feld.*, Verh. Zool. Bot. Ges., xii., p. 491, n. 179, 1862; *Herr Schaff.*, Ent. Stett. Zeit., t. 3, fig. 12; *Hesperilla doclea, Hew.*, Desc. Hesp., p. 39, n. 4, 1868; ? *Tel. arsenia, Plotz.*, Stett. Ent. Zeit., xlv., 384, 1884.)

Male, 26-30 mm. Head, palpi, thorax, and abdomen dark fuscous, thorax and abdomen clothed with greenish-ochreous hairs, beneath whitish-ochreous. Antennæ dark fuscous, annulated beneath with ochreous-whitish, club reddish above, whitish ochreous beneath. Legs ochreous. Forewings elongate-triangular, termen gently bowed, oblique; ochreous-fuscous, with golden reflections; base of wing clothed with short dense yellowish hairs; markings whitish, somewhat hyaline; an elongate mark in posterior end of cell, posteriorly narrowly curved upwards so as to becoming somewhat sickle-shaped; a somewhat quadrate post-cellular dot, just beyond apex of stigma, indented above middle posteriorly; a small dot obliquely below; a transverse series of 3 small sub-costal spots, at about two-thirds from base; stigma black, broad, entire, oblique, extremities much narrower, from immediately above inner margin to just before first post-cellular quadrate spot; cilia whitish, basal half fuscous. Hindwings with termen rounded; color as in forewings; basal two-thirds of inner margin clothed with long ochreous hairs; cilia as in forewings. Under side of forewings fulvous, becoming fus-

in posterior end of cell, rarely obsolete; a small roundish spot almost touching apex of stigma; an oblique transverse row of 3 small sub-costal spots, at about two-thirds from base, sometimes edged with fuscous; stigma hyaline, broadly edged with black on either side, from inner margin just beyond middle, somewhat curved outwards so as to nearly touch post-cellular spot, anteriorly twice indented, much constricted below middle; cilia greyish-fuscous, with blackish points at extremities of veins. Hindwings with termen hardly waved; dark fuscous, with golden reflections, hairs on base and inner margin somewhat ochreous; cilia as in forewings. Under side of forewings fulvous, markings of upper side, except stigma, reproduced; a dull whitish patch above anal angle. Hindwings with a transverse sub-median band of about six indistinct contiguous reddish-ochreous spots; cilia as above.

Female, 26-30 mm. With coloring as in male, 8-shaped, post-cellular and sub-costal spots as in male, beneath post-cellular spot is a larger spot, slightly and obliquely beyond; a smaller spot below this, and indications of another beween the two last-mentioned; cilia as in male. Under side of both wings as in male, markings of forewings reproduced, excepting the two spots below second post-cullular spot; transverse band of hindwings more pronounced than in male.

Closely allied to *Doubledayi*, Feld. The male is best distinguished by the cellular spot, which in the present species is somewhat obscured but well developed and large in *Doubledayi*. The female is much more similar, but the additional post-cellular spots and coloring of hindwings are efficient characters to distinguish it from that species.

Healesville, Nar-Nar-Goon, Lake Tyers, Victoria; Brisbane, Mackay, and Duaringa, Queensland.

32. Telesto sexguttata, Herr-Sch.

(Stett. Ent. Zeit., p. 80, n. 64, t. 3, fig. 16, 1869).

Male, 30 mm. Head, thorax, palpi, antennæ, and abdomen golden-ochreous. Forewings elongate-triangular, termen nearly straight, faintly sinuate on lower half; golden-ochreous, markings pale ochreous; a cartridge-shaped spot just above and beyond apex of stigma; a second, much smaller, somewhat triangular, immediately below; a third, more suffused below second, and a fourth, suffused resting on vein 1; an oblique transverse series of 3 (lower one more or less absent) sub-costal spots before apex; second largest; stigma narrow, waved.

oblique, entire, black; commencing at base of vein 5 and terminating on vein 1 near fourth spot; cilia pale ochreous, with a dark line at base. Hindwings with termen faintly waved; color and cilia as in forewings; a few ochreous hairs below cell. Under side of both wings pale ochreous; a broad dull fuscous sub-median streak on forewings; markings of upper side reproduced; a dull whitish elongate patch on inner margin near anal angle; cilia of both wings as above.

Female, 36 mm. Color and markings, except stigma, as in male, but spots larger, the fourth being conspicuous; the third is absent.

An easily recognised species; the absence of the third subcostal spot is curious. A specimen in the Macleay Museum, probably referable to this species, has all the markings of forewings, except stigma, obscured, otherwise similar. Herrich-Schaeffer's figure is accurate; it represents the female.

Bowen, Queensland; two specimens, male and female, in Brisbane Museum collection.

33. Telesto perronii, Latr.

(*Hesperia perronii, Latr.*, Enc. Meth., ix., p. 763, n. 100, 1819; *Tel. perronii, Bdv.*, Voy. Astr. Lep., p. 164, 1832; *T. Kochii, Feld.*, Verh. Zool. Bot. Ges., xii., p. 491, n. 179, 1862; *Herr Schaff.*, Ent. Stett. Zeit., t. 3, fig. 12; *Hesperilla doclea, Hew.*, Desc. Hesp., p. 39, n. 4, 1868; ? *Tel. arsenia, Plotz.*, Stett. Ent. Zeit., xlv., 384, 1884.)

Male, 26-30 mm. Head, palpi, thorax, and abdomen dark fuscous, thorax and abdomen clothed with greenish-ochreous hairs, beneath whitish-ochreous. Antennæ dark fuscous, annulated beneath with ochreous-whitish, club reddish above, whitish ochreous beneath. Legs ochreous. Forewings elongate-triangular, termen gently bowed, oblique; ochreous-fuscous, with golden reflections; base of wing clothed with short dense yellowish hairs; markings whitish, somewhat hyaline; an elongate mark in posterior end of cell, posteriorly narrowly curved upwards so as to becoming somewhat sickle-shaped; a somewhat quadrate post-cellular dot, just beyond apex of stigma, indented above middle posteriorly; a small dot obliquely below; a transverse series of 3 small sub-costal spots, at about two-thirds from base; stigma black, broad, entire, oblique, extremities much narrower, from immediately above inner margin to just before first post-cellular quadrate spot; cilia whitish, basal half fuscous. Hindwings with termen rounded; color as in forewings; basal two-thirds of inner margin clothed with long ochreous hairs; cilia as in forewings. Under side of forewings fulvous, becoming fus-

cous from below cell and towards lower half of termen; inner margin broadly fuscous-whitish; markings of upper side reproduced, but lower post-cellular spot much enlarged and somewhat cuneiform; cilia fuscous-fulvous. Hindwings fulvous; a few obscure spots of fuscous near base; a sub-median row of transverse fuscous spots; cilia as in forewings.

Female, 34 mm. Head, palpi, thorax, antennæ, legs, and abdomen as in male. Forewings with costa arched at base, termen bowed, oblique; ochreous-fuscous, somewhat tinged with purplish, basal one-third of wing clothed with short ochreous hairs; markings silvery-white; an irregularly eight-shaped spot at posterior end of cell, upper half much constricted, and almost obsolete in some specimens; a cartridge-shaped spot beyond lower extremity of cell; an elongate quadrate spot before and below it, separated by intervening vein; an oblique transverse row of 3 quadrate spots at two-thirds from base, median smallest; cilia as in male. Hindwings with termen rounded; color as in forewings, basal two-thirds of inner margin clothed with dull ochreous hairs. Under side of forewings dull ochreous-fuscous; markings of upper side reproduced; inner margin as in male. Hindwings with color as in forewings; sub-median series of dots as in male, but hardly traceable; cilia fuscous.

The male of this is easily recognised by the broad black stigma, which indicates the species with certainty; the female on the upper side is not unlike a large female specimen of *Doubledayi*, Newm. We have doubtfully quoted *Arsenia*, Plotz., as a synonym; possibly that species is identical with female of *Ismene*.

Larvæ full fed 25-30 mm. Head reddish-fuscous, mixed with blackish and becoming broadly blackish behind and on sides; V-shaped mark fuscous moderately indicated, body cylindrical, moderately thick throughout, hardly smooth; light fuscous, finely irrorated with blackish. (In the early stages it is fleshy-pink, without any traceable lines.) Dorsal well defined, moderate, black; spiracular, supra, and sub-spiracular dark fuscous, latter very faintly indicated, spiracles small, fuscous; anal segment paler than general ground color. Feeds on various grasses (? *Xerotes*, Sp.); also bred from larvæ feeding on *Cladium asperum*. Pupæ dark fuscous, shaped exactly as in *Trapezites iacchus*, *Fab.*

Sydney and Como, New South Wales; Ocean Grange, Victoria; Brisbane to Mackay, Queensland; from November to February, eleven specimens.

34. TELESTO COMPACTA, Butl.

(Male. A.M.N.H. (5), ix., p. 87, 1882; female, *Hesperilla scepticalis*, Rosen, *l.c.*, xvi., p. 379, t. 11, fig. 2, 1885; *A. and S.*, Vict. Butt., p. 127, 1893.)

Male, 25 mm. Head, palpi, thorax, and abdomen golden-ochreous, densely clothed with short greenish-ochreous hairs; beneath whitish. Antennæ dark fuscous, annulated beneath with ochreous, club with apical two-thirds reddish. Legs reddish-ochreous, anterior pair mixed with whitish. Forewings elongate-triangular, costa slightly arched at base, faintly sinuate in middle; termen bowed, oblique; dark golden-ochreous; markings yellowish-white; an elongate sub-crescentic mark in posterior end of cell, posterior extremity hardly reaching end of cell; a moderate roundish post-cellular spot above and beyond apex of stigma; an oblique transverse series of 3 somewhat quadrate sub-costal spots, at about two-thirds from base, median smallest; stigma short, black, somewhat broken into spots, obliquely placed, from considerably above inner margin towards anterior edge of post-cellular spot, but not near reaching it; cilia ochreous-reddish, mixed with blackish and with a dark fuscous terminal line. Hindwings with termen slightly waved; color as in forewings; base and inner margin clothed with greenish-ochreous hairs; markings yellowish-white; 2 very small roundish spots at one-third from base in middle; a transverse band of four cartridge-shaped spots at about two-thirds from base, upper one much smaller and touching second; cilia as in forewings. Under side of forewings yellowish-orange, dorsal half broadly blackish-fuscous; markings of upper side, except stigma, reproduced, but color more silvery, especially sub-costal spots. Hindwings reddish-ochreous; markings of upper side reproduced in silvery white, and more or less edged with dark fuscous; an additional similar and smaller spot lying between veins 7 and 8 near base; 2 very small spots, one above first spot of band; second, adjacent to fourth spot of band, the whole forming a band of six spots instead of four; cilia reddish-ochreous.

Female, 24-26 mm. Head, palpi, thorax, and abdomen dark fuscous, clothed with greenish-yellow hairs, beneath whitish, abdomen beneath fleshy-white. Legs reddish-ochreous. Antennæ dark fuscous, annulated above and below with white, club dark fuscous, beneath reddish. Forewings elongate-triangular, costa gently arched, termen bowed, oblique; dark golden-fuscous; basal area sparsely clothed with short ochreous hairs; markings whitish, semi-hyaline; a somewhat 8-shaped spot

in posterior end of cell, upper half constricted; a moderate cartridge-shaped post-cellular spot, considerably beyond first; a moderate quadrate spot below; a small triangular spot above inner margin, at about two-thirds, lying on vein 1; cilia reddish fuscous, base blackish. Hindwings with color as in forewings, termen rounded, basal and inner marginal areas more or less clothed with long orange hairs; a large yellowish, in male orange, elongate-quadrate spot in middle of wing, immediately below posterior extremity of cell; two small, suffused, somewhat cuneiform yellowish spots, parallel to this, second hardly perceptible on account of density of inner marginal hairs; cilia as in forewings. Underside of forewings with costal half orange-ferruginous, dorsal half more or less dark fuscous; a narrow streak whitish-lilac, from apex along termen to above anal angle; markings of upper side reproduced; cilia ochreous-ferruginous. Hindwings with color as in forewings, lilacine streak continued as a band for whole length of termen, and edged above by its own width of dark ferruginous, on upper extremity of which is a series of suffused blackish, white-centred small spots; markings of upper side reproduced in obscure ochreous-white; two or three suffused similar dots between posterior extremity of cell and base; cilia as in forewings.

The male of this species stands conspicuously distinct by the hyaline markings of hindwings, and approaches no other described species from Australia; the female is a totally dissimilar looking insect, and was until recently considered a distinct; in fact, Watson (P.Z.S., 1893), stated that they constituted distinct genera, but Mr. Waterhouse has taken them frequently *in cop*, which is decisive. The under side of this sex is not unlike the female, *Trapezites maheta*, Hew. Mr. Miskin has re-described (P.R. Soc., Queensland, p. 149, 1889) what he considers the male of this species, and from the description it evidently pertains to this species, although no mention is made of the stigma being present.

Sydney, Newcastle, and Katoomba, New South Wales; Gisborne, Macedon, Wandin, Pakenham, Ferntree Gully, and Sale, Victoria; four specimens from February to April.

Mr. Miskin records it from Port Darwin.

35. Telesto senta, Misk.

(Female. *Hesperilla senta*, Misk., Ann., Q'nd. Mus. Supp., 1891.)

Male, 28 mm. Head, thorax, palpi, and abdomen dark fuscous, abdomen ringed with whitish, palpi, and thorax beneath ochreous-whitish. Antennæ dark fuscous, spotted beneath

with whitish, club reddish. Legs dark fuscous, yellowish tinged. Forewings elongate-triangular, costa faintly sinuate in middle, termen hardly rounded, oblique; dark golden-fuscous; markings silvery white; an irregular quadrate spot in posterior end of cell, strongly indented anteriorly and posteriorly, lower edge somewhat elongate; a dull ovoid spot immediately below; stigma narrow, entire, oblique, somewhat whitish, edged posteriorly by a narrow black line, from two-thirds of inner margin to base of veins 4 and 5; a somewhat cartridge-shaped spot touching its apex; a small spot immediately below preceding spot; an oblique transverse row of 3 cartridge-shaped sub-costal spots at two-thirds from base, median smallest; cilia dark fuscous-whitish. Hindwings with termen rounded; color and cilia as in forewings; a moderate ovate whitish spot at two-thirds from base, between veins 6 and 7; a similar spot at two-thirds from base, between veins 3 and 4. Under side of forewings dark fuscous, markings of upper side, excepting stigma reproduced; cell with some orange scales; 3 irregular suffused ochreous patches between inner margin and cell, hardly forming definite markings. Hindwings with color as in forewings; inner margin broadly irrorated with yellowish scales; markings whitish more or less edged with fuscous; a very obscure spot at base of veins 7 and 8; a second in end of cell, moderate, roundish; a third between veins 7 and 8 at two-thirds from base; a fourth, ovate, largest, immediately below; and two others, similar and parallel, between veins 2 and 4; an obscure row of small parallel whitish dots before termen.

Female, 31 mm., with color and markings as in male, but forewings with an additional sub-costal spot, large quadrate spot resting on vein 1 in middle, and the other spots much enlarged, especially that between veins 2 and 3. Hindwings: a large spot at posterior extremity of cell and a curved row of six hyaline spots before and parallel to termen, apical one the largest. Under side as in male.

Nearest *Croceus*, Misk., but very distinct and easily recognised by the number and arrangement of spots on upper side of hindwings.

Cooktown and Cairns, Queensland; two specimens in November.

The type (female) is in the Brisbane Museum.

36. Telesto croceus, Misk.

(Male. *Hesperilla croceus*, Misk., Proc. Roy. Soc., Q'd, p. 150, 1889; female, *l.c. nec.*, *Croceus*.)

Male and female, 30-36 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark ochreous-fuscous, palpi beneath whitish-ochreous, thorax clothed with yellowish hairs, abdomen ringed obscurely with whitish-ochreous. Forewings elongate, triangular, costa nearly straight, termen gently bowed, oblique; dark ochreous-fuscous, basal half of wing, especially in male, clothed with dense golden-ochreous hairs; markings pale ochreous; a transverse spot in posterior end of cell, in male elongate and continued along lower margin of cell to near middle, appearing somewhat sickle-shaped; an oblique transverse series of 3 sub-costal spots at three-fourths from base, median smallest; a small quadrate spot between veins 3 and 4 near base; another immediately below, between veins 2 and 3; in male elongate, narrow, in female large and cartridge-shaped; stigma black, erect, narrow, somewhat broken into spots, from immediately above inner margin at two-thirds to base of veins 3 and 4; cilia fuscous, becoming ochreous around anal angle. Hindwings with termen rounded, faintly sinuate before anal angle, color and basal hairs as in forewings, but yellow hairs mixed with scales and extending to beyond three-fourths of wing; 2 round whitish ochreous spots, separated by intervening vein, in middle of wing at two-thirds from base; cilia ochreous, fuscous at base. Under side of both wings fuscous, densely irrorated with orange-yellow scales, so as to appear orange-eyellow; markings of upperside, except stigma, reproduced; inner margin broadly whitish-ochreous throughout, more pronounced in female; markings of hindwings reproduced; cilia brighter than above.

Nearest *Xanthomera*, but differs by presence of spots on hindwings. Mr. Miskin, in describing the species, stated that the female had no spots on hindwings, but the insect which he mistook for the female of this species is the following species. The female *Croceus* has spots on hindwings similar to male, though sometimes obscured, and at first sight bears a close resemblance on upper side to *Trapezites tasmanicus*, Misk.

Brisbane, Cooktown, Cairns, and Townsville, Queensland; in October and November.

37. Telesto xanthomera, n. sp.

Male 30, female 36 mm. Head, palpi, antennæ, thorax, legs and abdomen dark fuscous, palpi whitish beneath, abdomen ringed with whitish, thorax clothed with yellowish hairs. Forewings elongate, triangular, costa faintly arched near base,

thence straight, termen gently bowed, oblique; ochreous-fuscous, with pale yellowish markings; basal hairs yellowish; stigma black, erect, edged with darker, entire, anteriorly dentate, from inner margin to base of veins 3 and 4; a large spot in end of cell, anteriorly indented above middle; in male becoming elongate on lower half; a second, somewhat cuneiform, lying at base of veins 3 and 4; a third, cartridge-shaped, immediately below; a fourth, ovoid, just below cellular spot, touching third, and sometimes confluent with it; a fifth, suffused, quadrate, lying on middle of vein 1; an oblique transverse series of 3 quadrate sub-costal spots at twothirds from base; cilia ochreous-fuscous, barred with dark fuscous. Hindwings with termen rounded; color as in forewings; basal hairs yellowish; an elongate, moderate patch of dull yellowish-orange scales in middle of disc; cilia whitish; barred with fuscous. Under side of both wings fuscous, densely irrorated with with yellow scales, so as to appear yellow; markings of upper side faintly reproduced; lower portion of cell blackish; a faint blackish suffusion beyond post-cellular spots; hindwings without markings.

Somewhat allied to the preceding, but easily separated by the absence of markings on hindwings above and below.

In one female specimen there are thirteen veins in forewing, caused by the stalking of vein 3. It occurs in one wing only.

Brisbane and Cairns, Queensland; two specimens in March and September. We have also seen specimens taken in Victoria and New South Wales.

38. Telesto crypsigramma, n. sp.

Male, 26 mm. Head, palpi, thorax, and abdomen dark fuscous, mixed with ochreous, hairs beneath whitish. Antennæ blackish (broken). Legs fuscous, mixed with whitish. Forewings elongate-triangular, costa gently arched at base, termen rounded, oblique; golden-ochreous; markings whitish, an irregular mark in middle of cell, suffused; two roundish spots beyond apex of stigma, upper largest; an oblique transverse row of 3 sub-costal spots near apex, upper one hardly traceable; stigma black, entire, moderately thick, oblique, from above inner margin to posterior extremity of cell, anterior edge suffused, posterior edge well defined; cilia fuscous-whitish (imperfect). Hindwings with termen faintly waved; color as in forewings, sparsely clothed with golden-ochreous hairs towards base; cilia fuscous. Under side of forewings dull ochreous-fuscous; markings of upper side faintly reproduced, excepting

post-cellular spots, which are prominent and somewhat enlarged; a large roundish dull white blotch at anal angle; cilia as above. Hindwings with color and cilia as in forewings.

This insect, although not in the best of condition for description, indicates a species easily recognised by the paucity of markings, and somewhat unusual shape of stigma, which latter is similar to that of the male, *T. perronii*, Latr.

Two specimens; Herberton, Queensland, in November.

39. Telesto bathrophora, n. sp.

Male, 28 mm. Head, palpi, thorax, antennæ, and abdomen blackish-fuscous, palpi, head, and thorax mixed with golden-greenish hairs, antennæ beneath annulated with whitish, club whitish beneath, palpi and thorax whitish beneath. Legs golden-fuscous. Forewings elongate-triangular, costa gently arched at base, termen gently bowed, oblique; dark fuscous, with a greenish-golden sheen; without markings; stigma entire, moderate, whitish, oblique, edged on either side narrowly with blackish, from above vein one to posterior extremity of cell, anterior edge with a moderate projection in middle, posterior edge moderately straight; cilia dark fuscous. Hindwings with termen rounded; color and cilia as in forewings; without markings; a few golden-ochreous hairs towards base. Under side of both wings ochreous-fuscous; inner margin of forewings broadly dull-whitish; cilia of both wings as above.

Female, 30 mm. Head, palpi, antennæ, thorax, legs, and abdomen as in male. Forewings as in male, but termen more bowed; markings white; a somewhat quadrate spot between veins 4 and 5 near base; an oblique transverse series of 3 quadrate sub-costal spots, median smallest; cilia as in male. Hindwings with termen rounded; cilia as in male. Under side of forewings as in male, markings of upper side reproduced; cilia as above. Hindwings somewhat darker; an obscure transverse band of dull whitish scales, from beneath costa in middle, curved round towards middle of inner margin, and there lost in general ground color; fainter indications of a parallel series above termen; cilia as above.

A conspicuous and easily recognised species. Distinct from all the known Australian Congeners by the whitish stigma and absence of markings in male. We believe this is the insect that Mr. Miskin considered to be *Halysia*, Hew.

Mackay and Duaringa, Queensland; three specimens in November and December.

7. *Trapezites, Hüb.

Club of antennæ elongate, pointed, more or less bent. Palpi obliquely ascending or sub-porrect, terminal joint short, sub-conical. Posterior tibiæ with all spurs. Forewings in male without stigma; 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings with 5 obsolete.

Differs from *Telesto*, Boisd., by the absence of stigma in male. The species vary very little, with perhaps the exception of *Iacchus* and *Phigalia*. In the following tabulation it will be noticed that the under side of hindwings forms the chief characteristic. The male and female present no differences, with the exception of the termen of hindwings of the former, which are somewhat prominent at anal angle.

1. Hindwings below fuscous, with a single black, white-centred spot	41 *Petalia*.
Hindwings below yellow, with similar spot and two additional above termen	40 *Heliomacula*.
2. Hindwings below, with a sub-median transverse row of large, white, blackish-edged spots ...	42 *Symmomus*.
Hindwings below without such spots	44 *Maheta*, female.
3. Hindwings below with 2 transverse series of roundish silvery spots	44 *Maheta*, male.
Hindwings below with elongate (one very elongate) silvery-white streaks	46 *Argenteo ornata*
4. Hindwings above with a large triangular orange median patch, not cut by veins ...	43 *Croites*, female.
Hindwings above with transverse orange patch cut by veins ...	5
5. Hindwings below fulvous, with 5 small white spots, blackish edged	42A *Iacchus*.
Hindwings below lilacine without such spots	6
6. Forewings above with orange spot in cell edged on either side with black	50 *Phigalia*.
Forewings above with cellular spot not edged with blackish ...	8
7. Hindwings above with 2 small roundish white sub-median	

spots ... ... 51 *Tasmanicus.*
Hindwings without markings ... 9
8. Hindwings beneath yellow, with a single white, black-edged median spot ... ... 45 *Lutea.*
Hindwings beneath fuscous, with similar but more blackish spot 1
9. Hindwings beneath ochreous-fuscous, with 3 transverse series of white lunulate spots ... 49 *Gracilis.*
Hindwings beneath orange-fuscous, with only one row of spots... 2
10. Forewings beneath with a very large cuneiform black patch, markings of upper side absent 47 *Sphenosema.*
Forewings beneath similar, but spots of upper side more or less reproduced ... ... 48 *Paraphaes.*

40. TRAPEZITES HETEROMACULA, n. sp.

Male, 36 mm. Head, thorax, and abdomen golden-ochreous, abdomen sparsely clothed with yellowish hairs, segmental margins narrowly whitish. Antennæ fuscous, faintly annulated with white, club ochreous beneath, reddish above. Palpi ochreous-yellow. Forewings elongate, triangular, termen gently bowed, oblique; fuscous, mixed with yellowish; a narrow elongate bright orange streak along dorsum from base to middle, finely attenuated at base; a somewhat suffused roundish spot immediately above posterior extremity of this streak; a large golden hyaline elongate-quadrate spot at base of veins 3 and 4; a second, similarly colored, elongate-cartridge-shaped spot immediately above, almost lying base of veins 5 and 6; a third quadrate in posterior end of cell; a transverse series of three sub-apical cartridge-shaped spots; cilia fuscous, becoming ochreous-tinged around anal angle. Hindwings with termen faintly sinuate before anal angle; color as in forewings, but cell darker; basal and dorsal hairs bright yellow; a rather short, moderate, irregularly edged, orange median band, posterior extremity extending to vein 6, anterior continued along cell towards base; cilia fuscous, becoming yellowish on terminal half. Under side of forewings bright yellowish; markings of upper side reproduced in pale whitish-ochreous. Hindwings with color as in forewings; band of upper side faintly reproduced; a moderately large black, white-centred median

spot; two small roundish, faintly fuscous edged whitish spots, lying midway between large spot and termen, cilia of both wings as above.

Appears to be intermediate in form between *Petalia*, Hew., and *Iacchus*, Fab., differing from the former by the brighter coloring and two additional spots on under side of hindwings, and from the latter by more abbreviated band of upper side of hindwings, and lesser number and position of spots on under side of hindwings.

Type in coll., Macleay Museum.

Endeavor River, Queensland; one specimen.

41. Trapezites petalia, Hew.

(*Hesperilla petalia*, Hew., Descr. Hesp., p. 32, n. 25, 1868; *Herr-Schaff*, Stett. Ent. Zeit, t. 3, fig. 11, 1869; *Telesto megalopis*, Meyr., Trans. Linn. Soc., N.S.W., p. 832, 1887.)

Male and female, 28-32 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, antennæ annulated with white beneath, palpi, thorax, and abdomen clothed with short ochreous hairs. Legs whitish. Forewings elongate-triangular, costa nearly straight, termen hardly rounded, oblique; golden-ochreous; markings semi-hyaline, dull golden; an irrregularly eight-shaped spot in posterior end of cell; in female much enlarged and becoming somewhat quadrate; a cartridge-shaped post-cellular spot immediately beyond, indented posteriorly; a much larger, somewhat quadrate spot, immediately below, similarly indented; an irregular yellowish spot obliquely below; in female much larger, quadrate, and more whitish; inner margin from base to before two-thirds narrowly yellowish; an oblique transverse series of 3 elongate quadrate sub-costal spots, lower largest; cilia whitish-ochreous, basal half fuscous. Hindwings with termen rounded; color as in forewings; dorsal half of wing clothed with long yellowish hairs, excepting beneath yellowish patch; a moderate median yellowish patch, immediately beyond cell, anterior edge distinct, posterior edge somewhat suffused; cilia as in forewings. Under side of forewings dull ochreous, dorsal half dark fuscous, cell broadly blackish towards posterior extremity; markings of upper side reproduced; cilia as above. Hindwings grey-whitish; a large distinct round black spot slightly above middle of wing, suffusedly edged with dull yellowish; a small white (in female large) spot in centre of black spot; cilia grey-whitish.

Considerable confusion has arisen in the past in reference

to the correct identification of this species, it having until recently been confused with *Lutea*, Tepp., and *Iacchus*, Fab. At first sight it could easily be mistaken for the former, but the preponderance of yellowish markings on that insect, coloring of under side and longer forewings, separate the present species with certainty; from *Iacchus* it is easily separated by its smaller size, and especially by absence of small series of dots on under side of forewings.

Brisbane and Mackay, Queensland; Como, New South Wales; four specimens in March and November, appearing to frequent *Leptospermum*.

42. Trapezites symmomus, Hb.

(Zutr. Ex. Schmett., f. 225, 226, 1823; *Matthew*, Trans. Ent. Soc., p. 183, 1888; *Staudinger*, Ex. Schmett, t. 100, 1888; *Telesto praxedes*, Plotz., Stett. Ent. Zeit., xlv., p. 378, 1884; *Trapezites symmomus*, A. and S., Vict. Butt., p. 114, 1893.)

Male and female, 44-56 mm. Head, palpi, thorax, antennæ, and abdomen dark fuscous; abdomen and thorax mixed with greenish hairs, becoming fulvous on thorax anteriorly, abdomen with yellow segmental rings, palpi beneath yellowish orange, thorax beneath golden fulvous, abdomen beneath reddish, club of antennæ beneath orange, apex reddish. Forewings elongate-triangular, costa gently arched, termen bowed, oblique; dark golden fuscous, markings golden, somewhat hyaline; a large quadrate spot in posterior end of cell; a moderate somewhat cartridge-shaped post-cellular spot, between veins 3 and 4; a large elongate spot immediately below, anterior extremity extending to beyond middle of quadrate spot in cell, anterior edge indented above middle; a small triangular spot immediately below anterior edge; an oblique transverse row of 3 quadrate sub-costal spots at two-thirds from base; basal third of wing clothed with short orange hairs; a moderate streak of orange along costa from base to end of cell; inner margin narrowly orange from base to before middle; an irregular quadrate spot of orange immediately above posterior extremity of last-mentioned streak; cilia dark fuscous, becoming orange around anal angle and lower fourth of termen. Hindwing with termen gently waved; dark fuscous, tinged with purplish; basal hairs orange; a broad transverse median band of orange, between veins 1 and 6, irregularly waved above and below, becoming narrower towards inner margin; cilia orange, becoming somewhat barred with fuscous at extremities of veins. Under side

of both wings reddish-ochreous. Forewings with markings of upper side reproduced, but triangular spot continued obliquely and narrowly to vein 1, color yellow, as is inner marginal spot; base of cell triangularly blackish; a dark fuscous line beyond the 3 sub-costal spots, gradually enlarging and becoming suddenly confluent over upper half of hindmarginal area of wing; cilia as above. Hindwing with markings white; a roundish spot strongly encircled with black; a spot at one-third of inner margin edged with black on lower portion only; a curved transverse row of 6 irregularly quadrate spots, edged with blackish, especially on upper margin; first between veins 1 and 2, largest; fourth and fifth smallest; sixth moderate, between veins 6 and 7; cilia orange, with faint fuscous bars at extremities of veins.

Larva full fed, 36-40 mm. Stout, cylindrical, tapering towards posterior segments, body rugose throughout. Head dark fuscous, becoming blackish posteriorly, usual V-shaped lines whitish, hardly meeting posteriorly, and edged with blackish on inner edges; face reddish-fuscous, body reddish-fuscous, minutely with blackish; dorsal line broad, blackish, not well developed except on edges, supra-spiracular similar; spiracular and sub-spiracular lighter fuscous, hardly traceable, spiracles small, blackish. Full fed in October. Feeds on *Xerotes longifolia* and *Cladium*. The pupa is sub-cylindrical, fuscous and spotted with blackish, the posterior segments are somewhat pointed.

Easily recognised by its large size and brilliant coloring.

Watson (P.L.S., 1893) spells the name *Symmonus*.

Mackay and Brisbane, Queensland; Frankston and Grampians, Victoria; Waverley and Como, New South Wales; five specimens November to April.

42A. Trapezites iacchus, Fab.

(*Papilis iacchus*, Fabr., Syst. Ent., p. 532, n. 389, 1775; *Don*, Ins. New Holl., t. 31, fig. 1, 1805; *Boisd.* (*Steropis iacchus*), Voy. Astr. Lep., p. 169, n. 3, 1832; *Trapezites elienz*, Hew., Desc. Hesp., p. 32, n. 24, 1868; *Hesperia maheta*, Misk. (*nec.*, Hew.), Ann., Queensland Mus., p. 78, 1891; *T. iacchus*, A. and S., Vict. Butt., p. 115, 1893.)

Male and female, 34-38 mm. Head, palpi, thorax, and abdomen dark fuscous, clothed with pale greenish-yellow hairs, beneath pale yellowish. Antennæ fuscous, annulated with ochreous, posterior half beneath ochreous, apical half of club reddish beneath. Legs dull orange. Forewings elongate-

triangular, costa gently arched, termen bowed, oblique, varying from golden fuscous to dark fuscous; markings as in *Symmomus*, but triangular spot beneath elongate spot absent; cilia dark fuscous, terminal half yellowish, especially round anal angle. Hindwings with termen gently waved; color as in forewings; basal and inner marginal hairs orange; a transverse band of orange between veins 1 and 6, divided by veins into 4 spots, first narrow; second narrow, wedge-shaped; third similar, but smaller; fourth large, elongate-quadrate, reaching from end of cell to above inner margin, but not near reaching it; cilia as in forewings. Under side of both wings orange-fulvous, upper two-thirds of forewings blackish-fuscous, excepting a wedge-shaped streak of ground color along termen; markings of upper side reproduced; cilia as above. Hindwings with 5 black, white-centred spots; first large, in cell near posterior extremity; second, third, and fourth moderate, arranged in a curved series at two-thirds from base, between veins 1 and 4; fifth small, obscure, at about two-thirds from base, between veins 6 and 7; inner margin broadly pale yellowish; cilia dull orange.

Allied to the preceding, but apart from its much smaller size it can be chiefly distinguished from that species by the orange band of hindwings being divided into spots by intervening veins, whilst in *Symmomus* it is entire. It also differs by the fewer number of spots on under side of hindwings, which in *Symmomus* are 8 in number. In the present species there are but 5. Most authors quote *eliena*, Hew., as a synonym, but it is just possible in error, as we possess an insect certainly allied to *iacchus*, but quite distinct, but not in a fit condition for identification. Hewitson's description indicates a differently colored insect to *iacchus*.

Larvæ and pupæ are similar to *Symmomus* in appearance and habits. Feed on *Xerotes multiflora*, R. Br. (*Brownii*, F. v. M.), *Graminaceæ*; the imago are not uncommon on *Leptospermum* blossoms (*R. Illidge*).

Frankston, Macedon, Gisborne (*Lyell*), and Ocean Grange (*Wise*), Victoria; Waverley and Como, New South Wales; Duaringa, Brisbane, and Mackay, Queensland; Hobart and Deloraine, Tasmania; eleven specimens from October to January, most common in December.

43. Trapezites croites, Hew.

(*Cyclopides croites*, Hew., Ex. Butt., v., fig. 14, 1874; *Astictopterus croites*, Misk., Ann. Queensland Mus., 78, 1891.)

Female, about 25 mm. Forewings dark fuscous, with yellow hairs towards base; an oblique yellow band before middle, not reaching costa or dorsum, posterior edge with double prominence above middle; a transverse-oblong yellow spot beneath costa at two-thirds, another beyond this between veins 4 and 6, and an irregular band at two-thirds from vein 4 to near dorsum; cilia pale yellowish, spotted with dark fuscous. Hindwings dark fuscous, with a large irregular well-defined yellow patch in disc; cilia as in forewings. Under side of forewings as above, but with ochreous-whitish apical patch. Hindwings fuscous, almost wholly suffused with ochreous-whitish; discal patch and a dorsal streak dilated to tornus, cream color.

The specimen being a female, the genus is doubtful. Described from the type which is probably unique, in British Museum.

Western Australia.

44. Trapezites maheta, Hew.

(Male. *Hesperia maheta*, Hew., Ann. N. H. (4), xix., p. 80, 1877; *Trapezites iacchus*, Misk. (*nec.* Hew.), Ann. Queensland Mus., 78, 1891.)

Male and female, 30-38 mm. Head, palpi, thorax, and abdomen dark fuscous, thorax and abdomen mixed with ochreous hairs, whitish beneath, antennæ dark fuscous, annulated with white beneath, club ochreous-whitish, apical half reddish beneath. Legs reddish fuscous. Forewings elongate-triangular, costa gently arched, termen gently bowed, oblique, faintly sinuate above anal angle; dark fuscous, with golden reflections; basal hairs yellowish, a yellowish sub-costal streak, suffused, from base to before middle; markings golden, somewhat hyaline; an irregular quadrate spot in posterior of cell, anterior edge constricted above middle, causing lower half to project somewhat, posterior edge faintly sinuate; a small somewhat quadrate spot considerably beyond, lying between veins 3 and 4 near base; a large cartridge-shaped spot lying just below, anterior edge from beyond middle of cellular spot, posterior edge to below middle of quadrate spot; an oblique transverse row of 3 somewhat roundish sub-costal spots at two-thirds from base; a somewhat moderate pentagonal spot of whitish-ochreous, below anterior edge of cartridge-shaped spot; inner margin narrowly yellow from base to beyond middle; cilia dark fuscous. Hindwings with termen rounded, somewhat prominent at anal angle; dark fuscous, somewhat purplish tinged; basal and inner marginal hairs long, yellowish-green; a mode-

rate, broad, transverse post-median band of yellow, at two-thirds from base, bounded by veins 1 to 6, edges more or less emarginate; cilia whitish suffusedly barred with fuscous at extremities of veins. Under side of both wings reddish-ochreous, somewhat tinged with flesh color; markings of upper side reproduced in pale yellow-whitish; upper margin of cell more or less yellowish, dorsal two-thirds of wing, excepting middle third of termen fuscous. Hindwings with 7 silvery-metallic spots, edged with fuscous; first largest, lying at base of cell, irregular-quadrate; second, somewhat pyriform, parallel and anterior to first; third moderate, at two-thirds from base, lying between veins 1 and 2; fourth small, immediately beyond; fifth smallest, just beyond fourth; sixth small, elongate, at two-thirds from base, lying between veins 6 and 7, and surmounted by a small fuscous dot; 2 very small spots parallel to fifth; yellow band of upper side somewhat reproduced in fleshy-ochreous; inner margin and anal angle dark fuscous; cilia as above.

This species stands in some collections as *Phigalia*, Hew., and although superficially somewhat similar it differs principally from that species by the color and markings of under side of hindwings, the color of *Maheta* being fleshy, whilst in *Phigalia* it is whitish, with a lilacine tinge. The silvery markings of under side of hindwings of male are a good distinction; the markings of upper side of forewings are much more abbreviated than in *Phigalia*; the base of wing is very scantily clothed with hairs; in *Phigalia* they are dense. The orange band of hindwings is narrower and extends much nearer to inner margin than in the other species mentioned. It is just possible that the insect figured on page 119, "Victorian Butterflies," is intended for the male of *Maheta*, although it is named *Phigalia*.

Brisbane and Mackay, Queensland; Waverley and Bathurst, New South Wales; five specimens from December to April.

45. Trapezites lutea, Tepp.

(*Hesperilla lutea*, Tepp., Trans. Roy. Soc., S.A., iv., p. 33, t. 2, f. 6, 1877; *Trapezites petalia*, Misk. (*nec.* Tepp.), Ann. Queensland Mus., 79, 1891.)

Male and female, 30-40 mm. Head, thorax, palpi, and abdomen dark fuscous, clothed with greenish yellow hairs, beneath yellowish-white. Antennæ dark fuscous, annulated beneath with white, club yellowish-white beneath, apical half reddish. Legs yellowish-white. Forewings elongate-triangular, costa

gently arched, termen gently bowed, oblique; ochreous-fuscous, golden tinged; basal two-thirds of wing clothed with short, dense, greenish-yellow hairs; markings pale yellow, opaque; an irregularly shaped spot in posterior end of cell; a second considerably beyond, hardly below; a much larger somewhat roundish spot obliquely before and below second; a fourth somewhat suffused, considerably before and below third; an oblique transverse series of 3 somewhat ovate sub-costal spots at two-thirds from base, median largest; cilia dark fuscous, becoming whitish at tips and around anal angle. Hindwings with termen rounded, color as in forewings; a large patch of long yellowish-green hairs from base along inner margin, occupying two-thirds of wing, on posterior extremity between inner margin and vein 4, the hairs appear to form 3 elongate streaks, separated by intervening veins; an elongate-quadrate patch of pale yellow at two-thirds from base, parallel to upper elongate streak of hair; cilia pale yellowish-white. Under side of both wings yellow; markings of upper side of forewings reproduced in pale yellowish-white, excepting sub-costal spots, which are hardly traceable; dorsal two-thirds of wing dark fuscous, excepting median third of termen; cilia whitish. Hindwings with a moderately large silvery-white roundish spot at end of cell, edged with black; cilia as in forewings.

Not unlike *Petalia*, Hew., but the preponderance of yellow above and below affords a ready test for recognition.

Stonyfell and Port Lincoln, South Australia; two specimens in November; also from Duaringa, Queensland; and Hobart, Tasmania.

46. Trapezites argenteo-ornata, Hew.

(*Cyclopides argenteo-ornatus*, Hew., Desc. Hesp., p. 41, n. 4, 1868; Ex. Butt., v., Cyc. and Hesp., fig. 18, 19, 1874; *Astictopterus argenteo-ornatus*, Misk., Ann. Queensland Mus., p. 79, 1891.)

Male and female, 30-36 mm. Head, antennæ, thorax, and abdomen dark golden-fuscous, post-orbital rims white, antennæ spotted with white beneath, club blackish, apex crimson, thorax and abdomen clothed with yellowish hairs. Palpi yellowish-white. Legs ochreous-white. Forewings elongate, triangular, costa slightly arched at base, thence straight, termen oblique, faintly rounded; dark fuscous; basal hairs dense, appressed, orange-ferruginous; markings yellowish-orange; a moderate, in male small, irregular quadrate spot in posterior end of cell; a second, quadrate, midway between first spot and termen; a third, similar, below and considerably before second;

a fourth, largest, considerably above inner margin in middle; an oblique transverse series of 3 quadrate sub-costal spots at two-thirds from base; cilia fuscous, chequered with whitish Hindwings with termen rounded, hardly prominent at apex; color as in forewings; basal and inner marginal hairs golden-ochreous; an elongate bright orange patch below middle of wing, nearer to costa than in inner margin; cilia as in forewings, but more whitish, especially round anal angle. Under side of forewings dark fuscous; costa with a moderately thick streak of yellowish, from base to apex, becoming blotch-like at apex and upper half of termen; markings of upper side reproduced, sub-costal spots almost white; cilia as above. Hindwings beneath fuscous-yellowish; markings metallic-silvery, edged with blackish; yellow post-median patch reproduced, but color yellow; a narrow elongate streak below costa, close to base; a second, similar, but smaller, below costa in middle; a third, somewhat diamond-shaped below costa before apex; a fourth in cell, elongate, narrowed, and slightly curved on upper third; a fifth, elongate, lying on vein 1 at one-third from base; a transverse row of 4 roundish spots at two-thirds from base, commencing at vein 1 and ending at lower extremity of yellow patch; inner margin broadly dull yellowish; cilia as in forewings.

Exceptionally distinct by the elongate silvery-metallic markings on under side of hindwings.

Perth and Fremantle, Western Australia; in October and November.

47. Trapezites sphenosema, n. sp.

Female, 34 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark fuscous, palpi beneath ochreous-whitish, antennæ annulated with whitish. Head and thorax clothed with golden-ochreous hairs, abdominal margins dull whitish. Forewings elongate-triangular, termen gently bowed, oblique; dark fuscous; basal half of wing clothed with short golden-ochreous hairs; markings obscure, dull ochreous; a small double spot in posterior extremity of cell; a second at base of veins 3 and 4; a third immediately below second, and an oblique transverse series of three sub-apical ones; cilia ochreous. Hindwings with termen rounded; color and basal hairs as in forewings, but hairs longer and extended along dorsum; cilia as in forewings. Underside: Forewings ochreous; a very large cuneiform black patch occupying upper five-sixths of wing, its apex directed to base. Hindwings ochreous-yellowish; a faint reddish spot in posterior extremity of cell; a faint transverse

post-median series of similar but smaller spots; cilia pale ochreous.

In the absence of the male the correct generic position cannot be assured, but in all probability it is rightly referred.

The curious wedge-shaped mark on underside of forewings is distinctive.

Perth, Western Australia; one specimen in November. We have seen others from the same locality.

48. Trapezites paraphaes, n. sp.

Female, 25 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark fuscous, head and thorax clothed with moderately long yellowish hairs, antennæ spotted with white beneath, palpi whitish beneath. Forewings elongate-triangular, termen gently bowed, oblique; dark fuscous, with ochreous markings; basal hairs ochreous; costal edge ochreous; a small quadrate spot in posterior extremity of cell; a second, similar, lying at base of veins 3 and 4; a third immediately below second, and a fourth resting on vein 1 at two-thirds from base; an oblique transverse series of three sub-apical spots, upper smallest; cilia ochreous. Hindwings with termen rounded; color cilia and basal hairs as in forewings, but basal hairs more dense and continued along dorsum. Under side: Forewings ochreous, markings of upper side, except spot on vein 1 reproduced; absent in some specimens; a large cuneiform black patch occupying upper five-sixths of wing, apex directed to base. Hindwings ochreous, somewhat tinged with reddish; two series (supra-median and sub-median) of obscure dull reddish spots; cilia of both wings as above.

Closely allied to the preceding, differing in its smaller size, coloring, and different shaped wings. The descriptions of this and the preceding read much alike, but the insects when placed side by side are quite distinct in appearance and easily separable.

Perth, Western Australia; one specimen received from Mr. Reid, taken in November. Mr. G. A. Waterhouse has a male specimen from King George's Sound. It differs only in the absence of spots on under side of forewings.

49. Trapezites gracilis, Tepp.

(*Pamphila gracilis*, Tepp., Trans. Roy. Soc., S.A., iv., 34, t. 2, fig. 7, 1881.)

Male and female, 26-32 mm. Head, palpi, thorax, and abdomen dark fuscous, palpi and thorax clothed with greenish-

yellow hairs, abdominal segments narrowly whitish. Legs reddish fuscous. Antennæ dark fuscous, annulated with white, club dull reddish beneath. Forewings elongate-triangular, costa slightly arched at base, termen slightly bowed, oblique; dark golden-fuscous, with white markings; a somewhat reniform spot at end of cell; an outwardly curved series of five quadrate sub-costal spots, from beneath costa at two-thirds, curved round to meet another series of four similar spots which terminate above inner margin at two-thirds, fifth spot of upper series smallest, second spot of lower series largest; cilia fuscous, chequered with white. Hindwings with termen rounded; color and cilia as in forewings; basal and inner marginal hairs golden-fuscous. Under side of forewings dark fuscous, excepting a moderately broad streak of reddish-ochreous along costa and apical third of termen; markings of upper side not wholly reproduced, but in male all markings reproduced, excepting lower 2 of second series of spots; spots of first series white, accompanied by a parallel series of 4 triangular white spots near termen, anteriorly blackish edged; the last-mentioned series of spots are also visible in female; cellular and other markings dull ochreous, hardly traceable in female; cilia as above. Underside of hindwings fulvous; markings white; an elongate cuneiform spot, from base to beyond middle of cell, dilated posteriorly; a narrow elongate spot lying above and beyond posterior extremity of first; a third, small, considerably beyond second; a fourth, very large, quadrate, immediately below third, with an elongate projection on upper posterior edge; a fifth, quadrate, lying between veins 1 and 2; irregularly indented above and below; a curved series of 5 (sometimes 6) parallel spots, between veins 1 and 6, indented above and below; fourth spot twice indented and sometimes separated into 2 spots; all markings more or less edged with dark fuscous, excepting posterior edges of last-mentioned spots; cilia as in forewings.

Easily distinguished by the markings of forewings and separation of all markings of under side of hindwings. It may be identical with *Astictopterus cynone*, Hew. Hewitson's figure (Ex. Butt., v., f. 14, 1874) approaches it so closely as to admit of little doubt.

Semaphore and Henley Beach, South Australia; Gunbower, Victoria; several specimens taken in June and December.

50. Trapezites phigalia, Hew.

(*Hesperilla phigalia*, Hew., Desc. Hesp., p. 32, n. 23, 1868; Herr Schaff., Stett. Ent. Zeit., t. 3, fig. 15, 1869; *Telesto phlœa*,

Plotz., Stett. Ent. Zeit., xlv., p. 378 (? 1884); *Trapezites phillyra*, Misk., Proc. Roy. Soc., Queensland, p. 153, 1889; female, A. and S., Vict. Butt., p. 119, 1893.)

Male and female, 34-40 mm. Head, palpi, thorax, and abdomen dark fuscous, densely clothed with long greenish-yellow hairs, beneath whitish. Legs fuscous-whitish, all coxæ white. Antennæ fuscous, annulated with white above and below, club beneath whitish, apical half reddish. Forewings elongate-triangular, costa slightly arched at base, faintly sinuate in middle, termen hardly bowed, oblique; dark fuscous-golden; markings orange; basal half of wing more or less clothed with short dense orange-yellow hairs; an irregularly quadrate spot in posterior end of cell, deeply indented anteriorly and posteriorly, ground color on either side becoming black; a large, in male small, elongate quadrate spot, below first-mentioned spot, surmounted at its posterior apical extremity by a moderate quadrate spot; a very small spot below second spot, near anterior extremity; an irregularly shaped yellowish, somewhat opaque spot, above inner margin in middle, in female almost touching lower edge of second spot; an oblique transverse series of 3 roundish, white, subcostal spots, at two-thirds from base, median smallest; inner margin narrowly edged from base to beyond middle with short orange hairs; cilia dull whitish, chequered with fuscous, basal half wholly fuscous. Hindwings with color as in forewings, termen faintly waved, apex and anal angle somewhat prominent, more especially in male, base and inner margin broadly clothed with long orange hairs; median band, between veins 2 and 6, twice dentate below and once above, posterior half much dilated; cilia as in forewings. Underside of both wings fleshy-whitish, somewhat lilacine tinged; three subcostal spots reproduced as above, accompanied below and beyond by two small fuscous dots; cell of forewings orange, becoming confluent with quadrate spot of upperside, in female containing a suffused blackish quadrate spot in middle, in male much smaller and somewhat pointed; an irregularly shaped patch of blackish beyond end of cell; other spots of upperside reproduced, somewhat confluent and edged posteriorly by 3 elongate-quadrate spots, separated by intervening veins; a somewhat cuneiform blackish spot just below blackish spot in middle of cell; cilia dull whitish, chequered obscurely with fuscous. Hindwings marked with a series of small, roundish fuscous rings filled with ground color; first roundish, between veins 7 and 8, at one-third from base; second irregular in cell, diamond shaped

near posterior extremity; third, irregular shaped, between veins 7 and 8 at two-thirds from base; fourth, below and beyond, between veins 6 and 7; fifth, sixth, seventh, eighth, and ninth forming a slightly curved transverse row at two-thirds from base, between veins 1 and 6, posterior pair much smaller, ninth sometimes with an adjacent fuscous fleck; tenth, small, considerably above ninth, accompanied by a similar fleck; cilia as in forewings, but less chequered.

The larvæ, which is very similar in appearance to *Iacchus*, feed on *Cladium*.

Not unlike *Maheta*, Hew., but the differences between the two species will be found explained at the footnote in reference to that species.

Gisborne, Macedon, Toora, Dutson, and Wandin, Victoria; Sydney and Katoomba, New South Wales; Rockhampton (*Miskin*), Ithaca Creek (*Illidge*), Queensland; Blackwood and Highbury, South Australia; several specimens from September to March, November being the month when the species is commonest.

51. TRAPEZITES TASMANICUS, Misk.

(*Hesperilla tasmanicus*, Misk., female, Proc. Roy. Soc., Queensland, p. 149; *Telesto comma*, Kirby, Ann. Mag. N.H., vi., p. 436, 1893.)

Male and female, 26-28 mm. Head, palpi, thorax, and abdomen dark fuscous, more or less clothed with greenish-yellow hairs, beneath whitish. Antennæ dark fuscous, annulated with white, club reddish beneath. Legs whitish. Forewings elongate-triangular, costa somewhat sinuate in middle, termen faintly rounded, oblique; dark golden fuscous; basal third of wing clothed with short yellowish hairs; markings pale ochreous-white; a large irregular-shaped spot in posterior end of cell, constricted above and becoming somewhat elongate on lower edge; an elongate-quadrate spot midway between last-mentioned spot and termen, surmounted by a small roundish spot; an oblique transverse series of 3 small quadrate sub-costal spots at two-thirds from base, median smallest; indications of 2 small yellowish spots below cellular spot; cilia dull whitish, chequered with fuscous. Hindwings with termen rounded; color as in forewings; basal and inner marginal areas clothed with moderately long yellowish hairs; 2, rarely 3, conspicuous, moderate, roundish whitish spots below middle of wing, only separated by intervening veins. Under side of forewings dark fuscous; a large grey-whitish triangular patch, extending from 3 sub-costal spots to apex and continued

middle of termen; cell with a few orange hairs; markings of upper side reproduced, excepting yellowish spots; cellular spot edged with blackish; inner margin narrowly dull-whitish; cilia whitish, chequered with black. Hindwings fuscous, wholly irrorated with grey-whitish scales, excepting 2 transverse irregular rows of small fuscous dots, at one-third and two-thirds from base; spots of upper side reproduced and edged with blackish; cilia as in forewings.

Distinct by the markings on hindwings; a similar character occurs in *Telesto croceus*, Misk., but the smaller size, absence of stigma in male, and additional spots on forewings, easily separate it from that species.

Hobart, Tasmania; Gisborne, Healesville, Lilydale, and Gembrook district, Victoria; four specimens, from November to January.

8. *Exometæca, Meyr.

Club of antennæ elongate, pointed, bent. Palpi subporrect, terminal joint moderately long, pointed. Posterior tibiæ with all spurs. Forewings of male without stigma; 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings; 5 present, somewhat nearer 6 at base.

Contains only the single species, which has the facies of some species of *Trapezites*. The presence of vein 5 in hindwings is, however, a distinctive character.

52. Exometæca nycteris, Meyr.

(Proc. Linn. Soc., N.S.W., ser. ii., p. 833, 1887).

Male, 27 mm. Head, palpi, thorax, and abdomen yellow-ochreous, palpi whitish on lower half, antennæ grey, club carmine above. Forewings elongate, triangular, costa nearly straight, termen hardly rounded, somewhat oblique; ochreous-fuscous, towards costa posteriorly tinged with darker fuscous; costal edge fuscous; a small dark fuscous longitudinal spot at base, near inner margin; a dark fuscous transverse linear mark in disc above middle; a cloudy fuscous dot beneath vein 2 before middle; 2 very small white spots, margined with dark fuscous, placed transversely in disc at two-thirds, upper between veins 3 and 4 at base; 2 dark fuscous dots placed transversely beneath lower of these; 3 very small white adjacent spots placed transversely beneath costa at three-fourths, margined posteriorly by a dark fuscous line, somewhat produced beneath; cilia fuscous, mixed with ochreous, becoming ochreous-yellowish towards anal angle. Hindwings with termen rounded; color as forewings, base more yellowish, costal

third wholly dark fuscous; a cloudy fuscous transverse mark in disc before middle; a curved transverse row of 5 very small cloudy dark fuscous spots at two-thirds, extending from near costa to below middle; cilia fuscous, mixed with ochreous. Under side of forewings fuscous, dorsal third pale whitish ochreous; white spots as above; a whitish transverse discal mark, margined with dark fuscous; a cloudy purplish blotch at three-fourths, reaching from costa two-thirds across wing, and enveloping the white spots. Hindwings beneath rather light fuscous, towards anal angle somewhat suffused with ochreous-whitish; a small, somewhat darker crescentic discal spot before middle; four very small darker fuscous spots arranged in a straight transverse series at two-thirds, one being above and 3 below middle.

Sits with wings projecting perpendicularly forward (as in a bat), so as to enclose the legs (*Meyrick*).

Albany, West Australia; one specimen, in December.

9. Apaustus, Hüb.

Club of antennæ rather short, hollowed, with short, abruptly narrowed point. Palpi ascending, terminal joint moderately long, slender, erect, pointed. Posterior tibiæ with all spurs. Forewings in male sometimes with stigma; 5 approximated to 4 towards base. Hindwings: 5 obsolete.

A genus of moderate extent, extending to Oriental region. The curious form of the antennæ is characteristic of the genus.

1.	Stigma of forewings absent	3
	Stigma of forewings present	2
2.	Hindwings beneath ochreous-fuscous, with a white sub-median band ...	53 *Papyria.*
	Hindwings beneath ochreous, sub-median band, yellow	54 *Flavovittata*
3.	Hindwings beneath bright ochreous, without markings, or faintly indicated	55 *Lascivia.*
	Hindwings beneath, light yellow to yellowish orange, markings of upper side moderately reproduced...	56 *Sunias.*

53. Apaustus papyria, Boisd.

(*Hesperilla papyria*, Boisd., Voy. Astr. Lep., p. 166, 1832; *Taractrocera celæno*, Cox. Entomologist, iv., 402, 1873; *H. fumosa*, Guest, Trans. Roy. Soc., S.A., v., p. 37, 1882; *Apaustus minimus*, Misk., Proc. R. Soc., Queensland, p. 153, 1889; *Tarac-*

trocera papyria, A. and S., Vict. Butt., p. 129, 1893; *Apaustus alir*, Plotz., Stett. Ent. Zeit., p. 165, 1885.)

Male and female, 18-24 mm. Head, palpi, thorax, and abdomen dark fuscous, palpi beneath yellowish, thorax and abdomen clothed with yellowish hairs, beneath white, abdomen posteriorly sometimes ringed with whitish. Antennæ fuscous, spotted with white. Legs whitish. Forewings elongate, triangular, costa faintly sinuate in middle, termen gently bowed, oblique; dark fuscous, with orange-yellow markings; a narrow costal streak from base to before middle; a streak along lower margin of cell, continued right around to posterior extremity, where it becomes dilated and indented on either side, finely attenuated towards base; a narrow streak along inner margin from base to two-thirds, anteriorly attenuated and edged above throughout by a narrow dark fuscous streak; an oblique transverse row of somewhat quadrate, more or less connected, spots from just beneath costa at two-thirds, and curved round to two-thirds of inner margin, the 2 above middle placed considerably beyond the 3 sub-costal ones; in the male the lower two-thirds of series of spots become confluent, and appear as a thick streak, which is edged anteriorly by a narrow black stigma throughout; cilia dull whitish-fuscous. Hindwings with termen faintly sinuate in middle; color as in forewings; basal and inner marginal hairs yellowish; markings orange; a narrow elongate in cell near base; a moderate transverse series of irregularly edged quadrate confluent spots beyond middle of wing, not reaching either margin; cilia as in forewings. Under side of forewings dark fuscous; costa throughout and upper two-thirds of termen broadly orange yellow; markings of upper side, except stigma, reproduced, becoming whitish-ochreous; a sub-terminal streak of light fuscous. Hindwings dark fuscous, irrorated throughout with yellowish scales; markings of upper side reproduced, but color whitish; cilia as above.

Somewhat allied to *Lascivia*, Rosen, but immediately distinguished from that species by the markings of under side of hindwings, which in *Lascivia* are absent Watson states (P.Z.S., 1893) that this is the only species possessing a stigma in male. This is erroneous, as *Flavovittata*, Latr., which is allied to *Papyria*, has a similar character, and we have two undetermined species of similar structure. The species described by Cox as *Celæno* undoubtedly refers to a slight variety of the present species, which does vary, but not to any appreciable extent.

The larvæ, which is of the usual yellowish-green Hesperid type, feed on *Imperata arundinacea*. It is similar in habits and appearance to *Lascivia* in both larval and pupal stages. The pupa is somewhat similar, but rather lighter fuscous, the posterior segments are covered with short bristles, above and below, the head has the anterior portion very rugose.

The imago frequent the blossoms of lucern (*Medicago sp.*).

Hobart, Tasmania; Parkside, Highbury, and Mount Lofty range, South Australia; Sydney and Como, New South Wales; Melbourne, Gisborne, &c., Victoria; Western Australia (*Miskin*); several specimens from November to March.

54. Apaustus flavovittata, Latr.

(*Hesperilla flavovittata*, Latr., Enc. Meth., ix., p. 768, n. 114, 1819; *H. bifasciata*, Misk. (*nec* Tepp.), Ann., Queensland Mus., p. 81, 1891).

Male, 20 mm. Differs only from *Papyria* as follows: All the white markings of under side are changed to ochreous-yellow, and the band of hindwings is much shorter.

Perth, Western Australia; two specimens in November.

55. Apaustus lascivia, Rosen.

(*Pamphila lascivia*, Rosen., Ann. N.H. (5), xvi., p. 378, t. 11, fig. 1, 1885; *Apaustus lascivia*, A. and S., Vict. Butt., p. 113, 1893.)

Male and female, 17-25 mm. Head, palpi, thorax, and abdomen dark fuscous, palpi beneath yellowish, thorax and abdomen densely clothed with long yellowish hairs. Antennæ fuscous, spotted beneath with yellowish, club blackish, basal two-thirds yellowish. Legs whitish, tibiæ and tarsi yellowish. Forewings elongate, triangular, costa nearly straight, termen obliquely rounded; dark fuscous; basal half of wing in male more or less minutely irrorated with yellowish, in the female the irroration extends along costa to apex; markings orange; a moderately thick streak along costa from base to middle, posteriorly cut by intervening veins; an elongate streak along lower margin of cell and continued right around posterior extremity, anteriorly attenuated; an oblique transverse row of 5 or 6 (generally 5) more or less quadrate spots, in male separated by veins, in female inclining to coalesce, from considerably below apex to above two-thirds of inner margin; a suffused spot below costa between extremity of costal streak and apex of transverse row; cilia fuscous-whitish. Hindwings with termen rounded, faintly sinuate before anal angle; color of

wing and markings as in forewings; basal and inner marginal hairs long, yellowish; a nearly straight row of 4 irregular cartridge shaped spots below middle, between veins 2 and 6; cilia as in forewings, but more orange. Under side of forewings orange-yellow, dorsal two-thirds black; markings of cell and lower three spots of transverse series reproduced; cilia as above. Hindwings and cilia light yellow-ochreous, without markings.

Distinct by the absence of markings on underside of hindwings.

The larvæ feed on *Imperata arundinacea* (*Graminaceæ*). The larvæ when full grown are one inch in length, pale green; the two anterior segments are smallest. When half-grown the head is totally black; when full-grown light brown, with the usual black V-shaped mark and black ring round the head. The larvæ when full-grown constructs a sheath similar to the one it feeds in; closes up both ends and casts the skin. The pupa is at first pale olive-green, gradually becoming light brown, and is about half an inch long. The pupal state is ten to twelve days. Each larvæ conceals itself by uniting the edges so as to form a sheath where it remains, when feeding, which is usually at night; it protrudes its head just outside the sheath and nibbles the edges of it; when one sheath is devoured a second is formed.

Fernshaw, Oakleigh, and Murrumbeena, Victoria; Sydney and Balmoral, New South Wales; Cairns (*Miskin*), Mackay (*Turner*), Queensland; Hobart, Tasmania; from November to February.

56. Apaustus sunias, Feld.

(*Pamphila sunias*, Feld., Sitzb. Ak. Wiss. Wien. Math. Nat. Cl., xl., p. 462; n. 54, 1860; *Ocybadistes walkeri*, Heron., Ann., Nat. Hist. (6), xiv., p. 106; *Ancyloxypha agraulia*, Hew., Desc. Hesp., p. 45, n. 3, 1868.)

Male and female, 17-24 mm. Head, palpi, thorax, and abdomen blackish, densely clothed with orange hairs, abdomen latterally yellow, beneath whitish. Antennæ blackish annulated with yellowish, apex of club black. Legs yellowish. Forewings elongate, triangular, costa nearly straight, termen obliquely rounded, less rounded in male; blackish-fuscous, with bright orange markings; a broad streak from base to just before two-thirds of costa, filling up whole of cell, except a narrow streak of ground color; an irregular triangular spot immediately beneath costa at five-sixths, anterior edge becoming confluent with costal patch in male; an oblique trans-

verse row of 4 spots; first immediately below and beyond triangular spot, irregular quadrate, anterior edge touching previous spot; second and third elongate, in male irregular-quadrate; fourth, irregular, in female constricted above middle; a narrow streak along inner margin from near base to two-thirds, above which is a suffused elongate streak; cilia dull ochreous, basal half blackish, round anal angle orange. Hindwings with termen faintly sinuate above anal angle; color as in forewings, markings orange; basal and inner marginal hairs orange; an irregular spot in posterior end of cell; a moderately broad curved transverse band below middle of wing, edges irregular dentate; a small spot above apical portion of band, in male becoming confluent with it; cilia orange. Under side of forewings orange-yellow, dorsal two-thirds of wing black, except towards termen; 3 lower spots of upper side reproduced; cilia as above. Hindwings beneath with color somewhat yellower; an obscure triangular patch of dull orange lying above inner margin, attenuated towards base; cilia as above.

Differs from its congeners by its brilliant coloring and broader markings.

The larvæ feed on *Cynodon dactylon* (Couch Grass), also *Imperata arundinacea*. According to Olliff (Ann. M.N.H., p. 36, 1888) they are pale green, darker at sides, considerably narrowed posteriorly, head dark brown with a white V-shaped mark in front; the lateral line very indistinct. Full fed larvæ 11 lines in length. Pupa grey, transparent. Fed on Couch Grass, at the roots of which it pupated. The imago appeared early in April.

Elwes and Edwards (Rev. Or. Hesp., p. 255, 1896), doubtfully query this species as synonymic with *Telicota dara*, Koll., an Asiatic species.

We once took this species in abundance at the Botanic Gardens, Adelaide, flying over the blossoms of Globe amaranth (*Gomphrena*) in February; also occurs at Sydney, Katoomba, Bathurst, &c., N.S. Wales; Gisborne, Melbourne, &c., Victoria; Brisbane to Cooktown, Queensland; Port Darwin; from November to April.

10. Telicota, Moore.

Club of antennæ elongate, apex pointed, bent. Palpi ascending, terminal joint short, pointed, erect. Posterior tibiæ with all spurs. Forewings in male with stigma; 3 in male approximated to 2, remote from 4, 5 approximated to 4 towards base. Hindwings: 5 obsolete.

An Indo-Malayan genus of moderate extent; two of the undermentioned species are found outside of Australia. In this and the following genus great care is necessary to separate the species, the markings in many instances being extremely similar.

1. Forewings rather short, stigma present, markings bright orange-yellow, cell with streak of ground color...	57 *Marnas*, male.
Forewings rather long, markings reddish orange, anterior two-thirds of cell, filled in with ground color	3
2. Posterior edges of transverse band of forewings continued as fine streaks along veins to termen, stigma present	59 *Augias*, male.
Posterior edges of transverse band of forewings, not or hardly reaching termen; stigma present ...	60 *Bambusæ*, male
3. Spot in cell of hindwings well marked	58 *Ohara*, female.
Spot in cell of hindwings not well marked	1

57. TELICOTA MARNAS, Feld.

(*Pamphila marnas*, Feld., Sitzb. A.K. Wiss. Wien. Math. Nat. Cl., xl., p. 462, n. 53, 1860; *Elwes and Edw.*, Rev. Orient. Hesp., p. 256, 1897).

Male and Female, 24-30 mm. Head, palpi, thorax, and abdomen blackish, mixed with greenish ochreous hairs, abdominal segments orange, palpi beneath yellow, thorax and abdomen beneath orange. Legs dull orange. Antennæ blackish, spotted beneath with orange, club beneath orange, apical third black. Forewings elongate, triangular, rather short, costa arched at base, faintly sinuate in middle, termen rounded, oblique; blackish-fuscous, with orange markings; a rather thick costal streak from base to middle, leaving extreme costal edge blackish; cell filled up with orange, except at posterior extremity, which is blackish and causes the orange coloring to appear rounded above and below; a narrow streak of ground color in middle of cell, attenuated anteriorly; an oblique transverse series of 3 subcostal spots at two-thirds from base; a very small (in some specimens moderate), spot considerably beyond and below subcostal spots between veins 4 and 5; a smaller spot obliquely above and touching last, absent in

some specimens; three obliquley placed spots; first cartridge-shaped, between veins 3 and 4, below and before the small spot; second similar, immediately below, between veins 2 and 3; third irregular, largest, strongly excised on either side in middle; stigma blackish, narrow, oblique anteriorly parallel to 3 previous spots; a narrow suffused streak along vein 1 from stigma to base; a moderate streak along inner margin from beneath irregular spot to base; cilia dull ochreous, at base fuscous, round anal angle orange. Hindwings with termen faintly sinuate above anal angle; color as in forewings, basal and inner marginal hairs orange; markings orange; a moderately broad irregular-edged median transverse band, between veins 1 and 6, continued as a streak along vein 1 to termen, band narrowed posteriorly, veins 3 and 4 obscurely outlined with fuscous on band; a small spot, sometimes absent, above apex of band; cilia orange-yellow, at base fuscous. Under side of forewing fulvous, dorsal two-thirds, except median third of termen blackish; markings of upper side, except stigma, reproduced; lower half of cell becoming black, except a median orange spot; cilia as above. Hindwings beneath yellowish-orange, becoming broadly tawny around termen; markings of upper side somewhat obscurely reproduced, edged above and below by indistinct blackish lunules; an obscure patch of blackish scales above anal angle; cilia as above.

This species stands in some collections as *Olivescens*, Herr. Sch., but the figure of that species in Ent. Stett. Zeit. (p. 79, n. 60, t. 3 fig. 14., 1869) does not agree with the species under review, but denotes a species described further on. The occasional additional spot above apex of transverse band of forewings appears on both the Brisbane and New Guinea specimens, but the Brisbane specimen lacks additional spot above transverse band of hindwings. Our male specimens (17 in number) agree exactly with the description given in Elwes and Edwards, Rev. Or. Hesp., 256, 1897.

Sydney, New South Wales; Mackay, Brisbane, and Kuranda, Queensland; in October and December. Also from Ambonia and New Guinea.

58. Telicota ohara, Plotz.

(*Hesperilla ohara*, Plotz., Stett. Ent. Zeit., xliv., p. 227, 1883.)

Female, 36 mm. Head, palpi, thorax, and abdomen blackish, thorax and abdomen more or less clothed with orange hairs, beneath yellowish. Antennæ dark fuscous, annulated with

ochreous beneath, club ochreous, apical half reddish. Legs orange. Forewings elongate, triangular, costa gently arched, termen rounded, rather strongly oblique; dark fuscous, very minutely irrorated with orange; markings bright orange; a moderate streak from base along costa to near the 3 sub-costal spots; an oblique series of 3 subcostal spots immediately beyond, median smallest; 2 elongate, sometimes confluent spots in end of cell, lower anterior; an oblique transverse row of 5 spots; first very small, roundish, beyond lower subcostal spot between veins 5 and 6; second small, quadrate, just below; third moderately large, cartridge-shaped, just below second, between veins 3 and 4; fourth similar, larger, below third; fifth, largest, irregular, posteriorly excised in middle; a narrow streak from anterior edge of this along vein 1 to base; a moderate streak along inner margin from below fifth spot, finely attenuated on anterior half. Hindwings with termen faintly sinuate above anal angle; color as in forewings; markings bright orange; basal and inner marginal hairs yellowish; a roundish spot in end of cell; a transverse band somewhat below middle, cut by intersecting veins into four spots, first between veins 1 and 2, somewhat obscure, but more or less continued along vein 1 to termen; second and third cuneiform, parallel; fourth large, elongate-quadrate; cilia orange, at base blackish. Under side of both wings orange; dorsal two-thirds of forewings, except median third of termen, blackish; markings of upper side reproduced; subcostal and 2 upper spots of transverse band edged on either side with blackish points; inner marginal streak absent; cilia as above. Hindwings with markings of upper side obscurely reproduced and edged above and below with blackish lunules; a large patch of blackish extending from inner margin almost to vein 2, not reaching base; cilia orange.

The markings of this species are extremely similar to the female of preceding, but it differs by the more oblique transverse band of forewings, intense coloring and spot in cell of hindwings, besides being much less hairy at base of wings.

Mackay and Brisbane, Queensland; in December.

59. Telicota augias, Linn.

(*Papilo augias*, Linn., Syst. Nat., i., p. 794, 1767; *Telicota augias*, *Distant*. Rhop. Malay., p. 382, pl. xxxiv., f. 23, 1886; *Pamphila Krefftii*, Macleay, Proc. Ent. Soc., N.S.W., p. 54, n. 20, 1866.)

Male and Female, 26-32 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, antennæ spotted with yellowish

beneath, club yellow, apical half reddish, thorax and abdomen clothed with long yellowish hairs, beneath yellowish. Legs yellow mixed with fuscous. Forewings elongate, moderate, costa straight, termen gently bowed, olique; dark fuscous, with bright orange markings; a broad streak along costa from base to middle, limited by intervening veins; interneural spaces between posterior extremity of streak and apex filled in with orange, and continued along vein 7 as a narrow streak to apex; a cuneiform spot lying between base of veins 6 and 7; an outwardly oblique transverse series of 5 somewhat elongate-quadrate spots from above inner margin at two-thirds, between veins 1 and 6, upper smallest, excised posteriorly in middle; second smaller, immediately below; third and fourth and fifth similar, but larger, the whole five have the upper and lower edges continued as a fine streak nearly to termen; not in female; cell filled in with orange, in female narrowly black in middle to two-thirds; a large cuneiform spot just below cell, from base to stigma, not in female, but appears as a narrow streak along vein 1; a narrow streak along inner margin from base to two-thirds, separated from cuneiform spot by a streak of ground color; stigma moderately thick, oblique, somewhat dentate anteriorly, and sometimes broken into 3 spots, from vein 1 beyond middle to base of vein 4; greyish-fuscous, edged on either side with black; cilia fuscous, around anal angle orange. Hindwings with termen distinctly sinuate above anal angle; color as in forewings; basal hairs yellow; lower two-thirds of cell filled up with orange, only indicated by a moderate spot in female, a submedian transverse band of orange band from veins 1 to 6, intersected by veins, upper edge irregular, lower edge excised between veins and continued along vein 1 to termen; a very narrow streak lying just above vein 6, separated from transverse band by vein; cilia yellow, fuscous at base on upper two-thirds. Under side of forewings orange; dorsal two-thirds except median third of termen blackish; markings of upper side, except stigma, reproduced; subcostal and transverse spots edged posteriorly with blackish lunules; cilia as above. Hindwings beneath orange, greenish tinged; markings of upper side reproduced in orange and edged above and below with blackish disconnected lunules; inner marginal area finely irrorated with blackish.

Immediately known from the preceding by the broad stigma and continuation of transverse streaks along veins towards termen. The species has a fairly wide range, but the Australian specimens do not differ from those taken in Calcutta.

Larvæ full fed; 35 mm. Moderate, cylindrical, somewhat rugose, anal segment with a few shorty fuscous hairs. Head hardly smooth, blackish with usual V-shaped black mark, on either side of which is a broad streak of light fuscous. Body light yellowish-green, with a suffused yellowish spot on tenth segment, anal segment with a black spot on posterior extremity, and a black transverse spot on anterior edge, faintly produced on lower edge; dorsal moderate, well developed, deep green, spiracular ochreous-white; supra-spiracular deep green; sub-spiracular indistinct. Spiracles ill-defined; greenish. Full fed in November; feeds on *Imperata arundinacea* (*Graminaceæ*). The pupæ are cylindrical, and smooth. Head dark fuscous, forehead without projection.

Sydney, New South Wales; Brisbane to Cooktown, Queensland; several specimens from November to April. Also from India, Ceylon, Java, &c.

60. Telicota bambusæ, Mre.

(*Pamphila bambusæ*, Moore, P.Z.S., p. 691, t. 45, fig. 11, 1878; *Pamphila pythias*, Mab. Pet. Nov., ii., 234, 1878; *Telicota bambusæ*, Dist. Rhop. Malay., p. 382, n. 2, t. 35, fig. 12, 1882-6.)

Male and female, 35-40 mm. Head, palpi, antennæ, thorax, legs, and abdomen as in *Augias*. Forewings elongate-triangular, termen gently bowed, oblique; color, markings, and stigma as in *Augias*, excepting that the transverse band of five spots is more abbreviated and have only the lower edges continued towards termen, but not near reaching it. Hindwings with termen distinctly sinuate before anal angle; color, markings, and cilia as in *Augias*. Underside of both wings as in *Augias*, excepting that the color of hindwings is generally bright orange-yellow, and in the female before us all markings are obliterated and slightly greenish tinged.

This species is closely allied to *Augias*, but apart from its larger size and more brilliant coloring of under side it can easily be distinguished from that species by the abruptions of orange transverse band of forewings. This character is more pronounced in the Indian and Indo-Malayan specimens before us, those from Australia showing a greater tendency to be continued as a fine streak along veins to termen.

Sydney, New South Wales; Mackay, Townsville, and Brisbane, Queensland; in November and December; also from India and the Malay Archipelago.

11. Erynnis, Schranck.

Club of antennæ elongate, apex pointed, bent. Palpi ascending, terminal joint short, stout, conical, erect, posterior tibiæ with all spurs. Forewings in male sometimes with stigma; 3 approximated to 4, 5 approximated to 4 towards base. Hindwings with 5 obsolete.

An Indo-Malayan genus of moderate extent, differing chiefly from the preceding by the occasional absence of the stigma and approximation of veins 3 and 4 of forewings. The yellow and black species being similar in markings, a satisfactory tabulation is difficult. The following is the best we can contrive:

1.	Wings blackish, without markings; cilia snow white ...	67 *Fuliginosa.*
	Wings blackish, markings dull orange; cilia fuscous-orange	6
2.	Under side of hindwings greenish-tinged, with two transverse rows of blackish spots ...	62 *Palmarum*, male.
	Under side of hindwings blackish-fuscous, with one row of bluish spots	1
3.	Forewings above without markings in cell, transverse band white...	*Cæsina.*
	Forewings above with cell filled up with pale yellow	2
4.	Forewings above without markings in cell, transverse band yellow	63 *Macleayi.*
	Forewings above with cell filled up with orange	5
5.	Forewings above with cartridge-shaped spot joining apical spots and transverse band ...	64 *Sperthias*, male.
	Forewings above without such spot	65 *Olivescens*, female
6.	Band of hindwings dull orange, moderately broad, rather broadly separated by intervening veins	66 *Ulama*, male.
	Band of hindwings bright orange, moderate, hardly separated by intervening veins	5

7. Wings above and below suffused with bright orange scales, markings hyaline, male without stigma ... ... 68 *Fulgida.*
   Wings above and below, moderately suffused with pale greenish - yellow, markings hyaline, male with very oblique whitish stigma ... 69 *Mathias.*
8. Forewings fuscous; markings bright orange, cell filled in with orange, except a median streak of ground color, median spots hyaline ... ... 61 *Angustula*, male
   Forewings blackish; cell without markings except a quadrate spot at posterior extremity, markings not hyaline ... 6
9. Hindwings beneath purplish, mixed with ferruginous, markings of upper side absent ... 4
   Hindwings beneath yellowish, tinged with fuscous, markings of upper side reproduced 5

61. Erynnis angustula, Herr-Sch.

(*Pamphila angustula*, Herr-Sch., Stett. Ent. Zeit., p. 79, n. 58, 1869.)

Male, 32 mm. Head, thorax, palpi, antennæ, and abdomen blackish, thorax and abdomen clothed with orange hairs, abdomen with ochreous segmental rings, antennæ spotted with yellowish beneath. Legs orange. Forewings elongate, triangular, termen obliquely rounded; dark fuscous, markings orange; stigma absent; a moderate streak along costa from base to beyond middle, accompanied at its posterior end by 3 fine interneural streaks of orange; a narrow streak along upper margin of cell; a similar streak along lower margin, somewhat bent up to nearly touch previous streak, leaving a streak of ground color in middle of cell; an oblique transverse series of 3 cartridge-shaped sub-costal spots at three-fourths from base; an elongate spot below resting on vein 4; an inwardly oblique transverse series of 3 spots; first cuneiform, partly hyaline, excavated posteriorly, lying between veins 3 and 4; second similar, just below; third below second, not hyaline, irregular,

excised in middle on either side; a narrow streak along inner margin, from beneath third spot to base, attenuated anteriorly; a similar short streak just above; cilia orange, more pronounced around anal angle. Hindwings with termen faintly sinuate before anal angle; color as in forewings; basal and inner marginal hairs orange; an orange spot in cell; a moderate transverse orange sub-median band, limited by veins 1 and 6, inclining to be continued along vein 1, but not reaching termen, edges of band somewhat crenulate, median portion with 3 hyaline spots, cilia as in forewings. Under side of forewings orange-fuscous, dorsal portion rather broadly blackish; markings of upper side reproduced; lower third of cell filled up black, leaving a spot of orange beyond middle; cilia as above. Hindwings orange, mixed with fuscous, markings and cilia of upper side reproduced.

Somewhat allied to *Marnas*, Feld., but the hyaline spots and absence of stigma readily separate it from that species.

Mackay, Queensland; one specimen. The type was taken in Fiji.

62. Erynnis palmarum, Moore.

(*Pamphila palmarum*, Moore, P.Z.S., 1878, p. 690, pl. xlv., fig. 6, 7, male and female; *Hesperia chrysozona*, Plotz., Ent. Stett. Zeit., xliv., p. 228, 1883; *Pamphila augiades*, Var., *bambusæ*, Staud, Iris., ii., pp. 144, 165, 1889; *Padraona chrysozona*, Semper, Schmett, Phillip., p. 301, pl. xlix., fig. 13, male, fig. 14 female, pl. B., fig. 11, larva (as *Telicota bambusæ*, 1892).

Male 40, mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, palpi beneath yellowish, club of antennæ beneath yellowish, apical half of club reddish, thorax and abdomen clothed with greenish-yellow hairs. Legs orange. Forewings elongate, triangular, costa gently arched towards base, faintly sinuate in middle, termen faintly rounded, oblique; blackish, with orange markings; basal hairs yellow; a moderate streak along costa from base to middle; two narrow streaks, posterior to this separated by veins; 3 elongate-cuneiform obliquely placed subcostal spots just beyond, posteriorly excised, and more or less continued as fine streaks along veins to costa and termen; cell filled up with orange; a series of 5 inwardly oblique transverse spots, excised anteriorly and posteriorly; first smallest, immediately below apex of third subcostal spot; second, third, fourth, and fifth gradually increasing in size, fifth largest, lower third continued as a streak along vein to

base; a moderate, posteriorly dilated, streak along inner margin from base to posterior extremity of fifth spot; cilia orange, blackish at base on upper two-thirds. Hindwings with termen rather strongly sinuate above anal angle, causing anal angle to appear prominent; basal and inner marginal hairs long, orange; color as in forewings; a moderate suffused orange patch in cell; a broad transverse orange submedian band, between veins 1 and 7, broadest anteriorly and then continued moderately along vein 1 throughout, edges of band more or less crenulate; cilia orange. Underside of forewings blackish; markings of upper side reproduced; subcostal and transverse series of spots edged posteriorly by a series of blackish spots, lower one becoming blotch-like and filling up space between vein 1 and inner margin; area between this and apex greenish tinged; basal third of cell blackish; cilia as above. Hindwings beneath greenish yellow; transverse band reproduced in reddish orange, and edged above and below with a blackish line, interrupted so as to form spots; a reddish, posteriorly black edged spot in end of cell; inner marginal area broadly reddish-orange, attenuated towards base; a large blackish blotch above anal angle, obscurely cut in centre by vein 1; a fine black line along termen, abruptly terminating at vein 2; cilia as above.

The female of this species is, according to Moore (P.Z.S., p. 690, 1878): "Paler brown above, the yellow bands of upper side also paler, less prominent, there being no yellow along costal border of forewings, and no median streak from base of hindwings. Under side pale vinous-brown, this color pervading upper portion of the discal on the forewings, and entire discal band of hindwings."

The male differs from its allies by the band of hindwings extending to vein 7, and the greenish under side of hindwings and attendant markings.

Scott (Austr. Sep., pl. xiv.) figures the male and female of this species as *Phineus*, Cr., and the female appears to be more like *Ulama*, Butler, but the male is well drawn and easily recognisable. The type of *Phineus*, Cr., came from Surinam, and has been erroneously recorded from Australia. Watson (P.Z.S., 1893) considers Scott's male to represent the male of *Augiades*, Feld., and the female a bad figure of *Prusias*, Feld. Both species, so far as we are aware, have not yet been taken in Australia. The larva, which is pale greenish yellow, feeds on various species of *Palms*. We have bred specimens from *Kentia fosteriana* in November.

Sydney, New South Wales; Cooktown, Townsville, and Mackay, Queensland. It has not occurred at Brisbane up to the present. From November to January; nine specimens.

63. Erynnis macleayi, Plotz.

(*Hesperilla Macleayi*, Plotz., Stett. Ent. Zeit., xliv., p. 227, 1883; ? *Pamphila autoleon*, Misk., Proc. Roy. Soc., Queensland, 2, p. 147, 1889.)

Male and female, 30-46 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, palpi beneath yellowish, thorax and abdomen clothed with yellowish hairs. Legs ochreous, fuscous tinged. Forewings elongate, triangular, costa nearly straight, termen gently bowed, oblique; dark purplish fuscous, markings orange; anterior half of costa dull orange; an oblique transverse series of 3 cartridge-shaped sub-costal spots at two-thirds from base, posterior extremities excised; an inwardly oblique transverse row of 4 spots; first very small, lying on middle of vein 4; second cuneiform, obliquely below; third similar, obliquely below second; third irregular quadrate, lying below on vein 1, the lower third is continued as a fine streak along vein 1 to base; a streak along inner margin from base to middle, posteriorly dilated; stigma short, irregular, broken into 3 spots, fuscous, lying close to anterior edge of transverse spots; cilia dark fuscous, becoming orange on lower third of termen. Hindwings with termen sinuate above anal angle; color as in forewings; basal and inner marginal hairs orange; a suffused streak in cell near base; a rather narrow sub-median transverse orange band, between veins 1 and 6, extremities suffused, hardly separated into spots by intersecting veins, upper edge deeply sinuate below apex, posterior edge somewhat lunulate; cilia deep orange, becoming fuscous on upper two-thirds at base. Under side of forewings ferruginous, tinged with purplish, much lighter on upper two-thirds of termen; markings of upper side reproduced in ochreous; a narrow ochreous streak in cell; cilia as above. Hindwings beneath with color as forewings, but somewhat tinged with ochreous; markings of upper side obscurely reproduced; a dull ochreous streak between veins 1 and 2; cilia as above.

Easily recognised by the paucity of markings and absence of coloring in cell on upper side of forewings. The stigma is obscure and liable to be overlooked. The large female is of exceptional size; the average is about 36 mm.

Cardwell, Cairns, and Brisbane, Queensland; ? Sydney, New South Wales; in November.

64. Erynnis sperthias, Felder.

(*Hesperilla sperthias*, Feld., Verh. Zool. Bot. Ges., xii., p. 492, n. 182, 1862).

Male 44, mm. Head, palpi, thorax, antennæ, and abdomen dark fuscous, thorax and abdomen clothed with dense ferruginous-orange hairs, beneath yellowish, abdomen with suffused lateral bands of orange posteriorly, antennæ beneath yellow, not spotted, club yellowish, apical half reddish. Legs orange. Forewings elongate, triangular, costa almost straight, termen oblique, faintly bowed; dark fuscous, with orange markings; a moderate costal streak from base to just before two-thirds, cut posteriorly by veins 9 to 12; an oblique transverse series of 3 elongate-cuneiform subcostal spots at three-fourths from base, posteriorly excavated, edged more or less, continued as fine streaks along veins towards termen and costa; cell filled up with orange, except a small patch of ground color at posterior end of cell, an inwardly oblique row of 5 spots; first small, immediately below posterior extremity of lowest subcostal spot, sometimes hardly traceable; second below and slightly beyond, similar; third cartridge-shaped, between veins 3 and 4 near base; fourth elongate-quadrate obliquely below; fifth irregular, lower half continued as a thick streak along vein 1 to base; some orange scales just above near base; a moderately thick streak along inner margin from base to middle, posteriorly dilated; cilia blackish, between anal angle and vein 1, orange. Hindwings with termen sinuate above anal angle; color as in forewings; basal and inner marginal hairs orange; markings orange; the basal hairs accumulate near posterior extremity of cell and form a more or less distinct patch; a moderately broad transverse submedian series of 5 somewhat quadrate spots, between veins 1 and 6, separated by intervening veins, except that between veins 1 and 2, which sometimes coalesce, thus forming only four spots; cilia orange narrowly mixed at base with blackish on upper two-thirds. Under side of forewings blackish; basal half of cell blackish; wings beyond cell and upper two-thirds of termen orange; markings upperside faintly reproduced; 3 lower spots between veins 1 and 4 very distinct, but streak along vein one, and inner marginal streak absent; a fine blackish hind marginal line, just reaching vein 2; cilia as above. Hindwings beneath orange-ferruginous, markings of upper side faintly reproduced; a large blackish elongate patch above anal angle; a smaller patch above termination of vein 1; hind marginal line and cilia as in forewings.

Distinct from the other similarly colored species in the Australian group by its large size. It has been known to Australian collectors as *Augiades* Felder, an insect, as before mentioned, occurs only in Amboina and Batavia. According to Elwes and Edwards (Rev. Or. Lep., pp. 250, 253) the female of that species is very similar to *Palmarum* Mre., and the females possess no sexual characters by which they may be separated. They state, however, in the male of *Augiades*, that the *whole* of the cell of forewing on under side is orange; in *Sperthias* the basal half is black. Most Australian collectors avow that the insect described by Butler as *Ulama* is the female of this species, but as we have no really reliable source of information (but we hope to have shortly) to depend upon, we think it better to retain them as distinct species for the present. This present species is very similar in appearance to the following, but the distinctive characters appear to be its larger size, additional dot below subcostal series (thus forming a complete fascia of marks), and broader band of hindwings, and additional mark above apex of same. These markings are fairly constant.

The larva feed on several kinds of palms, notably *Livistona Australis*, *Kentia fosteriana*, and *Belmoriana*. The imago appears from November to February.

Brisbane, Mackay, Cooktown, and Cairns, Queensland; Sydney, New South Wales; Java, India, and Borneo.

65. Erynnis olivescens, Herr-Sch.

(*Pamphila olivescens*, H.S., Stett. Ent. Zeit., p 79, n. 60, t. 3, fig. 14, 1869).

Female, 36-38 mm. Head, palpi, antennæ, thorax, legs and abdomen as in *Sperthias*. Forewings elongate-triangular, termen gently bowed, oblique; color and markings as in *Sperthias*, but orange spot between veins 7 and 8 and connecting subcostal spots with transverse fascia absent. Hindwings with termen rounded, faintly produced before anal angle; color and markings as in *Sperthias*, but sub-median band much narrower and not continued above vein 6; cilia of both wings as in *Sperthias*. Under side of both wings orange-yellow, markings of upper side, except inner marginal streak, reproduced in pale ochreous; dorsal third of wing, except along termen, blackish; basal half of cell blackish, division suffused.

The specific distinctions are given at footnote of previous species. This is the insect which has stood for *Phineus*, Cr., in Australian collections, and is probably the one Mr. Mat-

thews refers to (T.E.S., p. 179, 1888) when writing on the subject. Its habits are similar to the previous species. Schaeffer's figure is good.

Sydney, New South Wales; Brisbane, Queensland; eight female specimens in November.

66. Erynnis ulama, Butler.

(*Pamphila ulama*, Butl., Trans. Ent. Soc., p. 504, 1870; ? *Corone ismenoides*, Mab., pet. Now. Ent., ii., ? 1878.)

Female, 38-42 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, palpi and thorax beneath ochreous, thorax and abdomen more or less clothed with yellowish hairs, antennæ beneath yellowish, club reddish on apical half. Legs ochreous-fuscous. Forewings elongate, triangular, costa gently arched on basal half, termen obliquely rounded; dark purplish-fuscous, somewhat shining; markings dull golden-orange; basal hairs bluish white; a somewhat quadrate spot in end of cell, excised in middle; upper edge more elongate posteriorly; an oblique transverse series of 3 elongate subcostal spots at two-thirds from base; a transverse series of 4 inwardly oblique spots; first cartridge-shaped, near base of veins 3 and 4; second below, similar, larger; third and fourth elongate, below second, only separated by a streak of ground color; all markings sometimes nearly obsolete; cilia dark fuscous. Hindwings with termen sinuate above anal angle; basal and inner marginal hairs bluish white; a sub-median transverse row of 5 equidistant orange spots, between veins 1 and 6, anterior pair rather obscure; cilia as in forewings, but orange around anal angle. Under side of forewings fuscous, purplish tinged, upper two-thirds of termen and apical area dull reddish; markings of upper side reproduced in ochreous-white, third and fourth spots of transverse series becoming confluent. Hindwings beneath with color as in forewings, basal area somewhat bluish-tinged; markings of upper side reproduced; inner marginal area broadly dark fuscous and becoming blotch-like on anal angle: cilia as above.

Not unlike female *Palmarum*, according to Moore's figure, but very different on under side. We have 2 supposed *males* of this species, but in poor condition.

Sydney, New South Wales; Bowen, Mackay, and Brisbane, Queensland; in November and January.

67. Erynnis fuliginosa, Misk.

(*Pamphila fuliginosa*, Misk., female, Proc. Roy. Soc., Queensland, vi., p. 147, 1889; male, *ib.*, Ann., Queensland Museum., p. 76, 1891.)

Male and female, 35-40 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark fuscous, thorax and abdomen sparsely clothed with yellowish hairs, palpi and thorax beneath ferruginous, abdomen beneath fuscous, with four whitish segmental rings, club of antennæ beneath ochreous. Forewings elongate-triangular, costa faintly sinuate in middle, termen obliquely rounded; blackish, fuscous, with bluish tinge; basal hairs yellowish; a narrow, obscure, yellowish streak along inner margin from base to middle; stigma black, oblique; cilia dark fuscous. Hindwings with termen slightly sinuate before middle; color as in forewings; basal and inner marginal hairs light ochreous; cilia dark fuscous, becoming snow-white from middle of termen to anal angle. Under side of forewings ferruginous, basal and median area more or less dark fuscous; some bluish scales near base. Hindwings beneath with color as in forewings; basal area bluish tinged; a transverse row of 4 equi-distant bluish spots beyond middle of wing, less distinct in male; cilia as above.

Known by the snow white cilia of hindwings.

Cairns, Cardwell, and Mackay, Queensland; in January.

68. Erynnis fulgida, Misk.

(*Hesperilla fulgidus*, Misk., Proc. Roy. Soc., Queensland, p. 151, 1889.)

Male and female, 28-32 mm. Head, palpi, thorax, antennæ, and abdomen dark fuscous, thorax and abdomen densely clothed with orange hairs, beneath orange, antennæ yellowish beneath, apical half of club blackish beneath. Legs yellow. Forewings elongate, triangular, costa nearly straight, termen oblique, faintly sinuate on lower third; dark fuscous, densely irrorated more or less throughout with fine ochreous orange scales, more dense on basal half of wing; markings yellowish, semi-hyaline; an oblique transverse series of 3 elongate subcostal spots, upper nearly obsolete, at two-thirds from base; a moderate, somewhat ovate spot lying on vein 4 and immediately below lower subcostal; a second,, cartridge-shaped, obliquely below, lying near base of veins 3 and 4; a third, large and similar, lying at base of veins 2 and 3, posterior edge excised; cilia fuscous-whitish, becoming dark fuscous on basal half. Hindwings with termen sinuate before middle; color as in forewings; base, cell, and inner margin densely clothed with long bright ochreous hairs, becoming very dense along vein 1; a transverse sub-median series of 4 yellowish semi-hyaline parallel spots, between veins 2 and 6, third spot more

elongate than others, and extending beyond apices of other 3; cilia yellowish, orange, blackish at base. Under side of both wings yellowish orange; dorsal third of forewings blackish; markings of upper side reproduced and edged with shining-golden; markings on hindwings reproduced and similarly edged. Cilia on both wings as above.

Known by its intense coloring and similarity of upper and under side of both wings.

Mr. Illidge has taken the larvæ on millett.

Brisbane, Mackay, and Duaringa, Queensland; in December.

69. Erynnis mathias, Fab.

(*Hesperilla mathias*, Fab., Ent. Syst. Supp., p. 433, n. 289, 290, 1798; *Hesperia thrax*, Led., Verh. Zool. Bot. Ges. Wren, 1855, p. 194, plate 1, figs. 9-10; *H. agna*, Moore, P.Z.S., p. 791, 1865; *H. chaya*, *ib. l.c.*, 791, 1865; *Pamphila mencia*, Moore, Ann. and Mag. Nat. Hist. (4), xx., p. 52, 1877.)

Male and female, 30-36 mm. Head, palpi, thorax, legs, and abdomen dark fuscous-golden, clothed with fuscous-golden hairs, head and palpi sometimes greenish-tinged, palpi and thorax beneath whitish-ochreous. Antennæ dark fuscous, beneath ochreous, spotted with blackish, club ochreous beneath, apical half reddish. Forewings elongate, triangular, costa gently arched, termen obliquely rounded, somewhat sinuate below middle; dark fuscous-golden, somewhat shining; basal and inner marginal areas clothed with greenish-yellow hairs; markings of male rather obscure, in female well developed, whitish; a spot in end of cell; a second immediately above; an irregular oblique transverse series of 3 roundish spots beneath costa at two-thirds from base; a small roundish spot below and slightly beyond, resting on vein 4, almost obsolete in male; a moderate roundish spot obliquely below and before, lying near base of veins 3 and 4; a large irregular diamond-shaped spot, lying near base of veins 2 and 3, only represented in male by a narrow streak, from which proceeds a very inwardly oblique dull whitish, black-edged stigma, reaching nearly to middle of vein 1; a moderate ovate spot lying on vein 1 beyond middle, obsolete in male; cilia dark fuscous, tips whitish. Hindwings with termen sinuate above anal angle; color as in forewings, dorsal two-thirds, except termen, densely clothed with ochreous hairs. Under side of both wings dark fuscous, clothed with ochreous-whitish scales, except dorsal two-thirds of forewings, which is fuscous, markings of upper side, except stigma, reproduced; a very small whitish sub-median

spot, sometimes absent, on hindwings between veins 2 and 3; not in male; cilia as above.

Somewhat allied to *Colaca*, Moore, but differs, according to Elwes and Edwards (Rev. Or. Hesp., p. 171, 1897), from that species by the absence of spots on hindwings *above*, although we possess a female specimen from Palmerston, South Australia, in which 2 yellowish sub-median spots are well developed, otherwise similar.

Mr. Miskin gives *Hesperilla julianus*, Latr., Enc. Meth., ix., p. 763, n. 99, 1819, as a synonym.

The larvæ are said to be attached to *Ischæmum pretinctum*.

This is probably the most widely distributed species we have in Australia; occurring also in India, Ceylon, Japan, Borneo, China, and Malayana, also Brisbane, Mackay, and Townsville, up to Cape York in Queensland; Palmerston, Northern Territory, South Australia; from October to February.

70. Erynnis cæsina, Hew.

(*Carystus cæsina*, Hew., T.E.S. (3), ii., 491, n. 15, 1866; Ex. Butt., v., Hesp., t. 6, fig. 15, 1866; *Pamphila albifascia*, Misk., Proc. Roy. Soc., Queensland, p. 148, 1889.)

Male, 26 mm. Head, palpi, thorax, and abdomen blackish, thorax and abdomen clothed with greyish hairs, palpi whitish white. Legs dark fuscous, coxæ more or less clothed with beneath. Antennæ black, club beneath, except apex snow white. Legs dark fuscous, coxæ more or less clothed with white hairs. Forewings elongate, triangular, costa gently arched, termen bowed on upper half, thence nearly straight, oblique; dark fuscous, spot with bluish purple; markings white; a small subcostal spot at two-thirds from base, indicating lower of subcostal series; a somewhat quadrate spot just below, resting on vein 4; a cuneiform spot lying at base of veins 3 and 4; a large, somewhat quadrate spot, obliquely below; a roundish spot immediately below this, sometimes accompanied by a suffused whitish spot below, almost coalescing; cilia blackish, basal half black. Hindwings with termen irregularly rounded; color as in forewings; basal area light fuscous; an oblique transverse band of snow-white just beyond extremity of cell, edges irregular, anteriorly narrowed and suffused, posterior extremity suffused, hardly reaching vein 7; cilia as in forewings. Wings beneath dark reddish, mixed with purplish; basal third of forewings and along inner margin fuscous; markings of upper side of forewings reproduced, and with an additional spot just below subcostal. Hind-

wings with a large white, somewhat triangular, irregularly edged patch, upper edge extending from base through middle of cell to vein 7 and two-thirds from base, with a deep indentation of ground color in middle and sinuate on either side of this; lower edge crenulate beyond middle, extending from veins 1 to 7, and containing a spot of ground color at base of vein 2; a white streak along inner margin, separated from patch by a streak of ground color; cilia as above, but becoming white around ternus.

The white club of antennæ and rich coloring of under side makes this species easy of recognition.

Cairns, Queensland; two specimens, in October; also from New Guinea.

12. NOTOCRYPTA, Nic.

Club of antennæ elongate, apex pointed, bent. Palpi subascending, terminal joint short, obtuse, porrected. Posterior tibiæ with all spurs, rather long. Forewings in male without stigma; 3 from rather near 4, 5 somewhat approximated to 4. Hindwings: 5 obsolete.

71. NOTOCRYPTA FELISTHAMELII, Boisd.

(*Thymele Feisthamelii*, Boisd., Voy. Astr. Lep., p. 159, pl. ii., fig. 7, 1832; *Pleisoneura curvifascia*, Feld., Wien. Ent. Mon., vi., p. 29, 1862; *P. alysos*, Moore, P.Z.S., 1865, p. 789; *P. albifascia, ib. l.c.*, 1878, p. 843, pl. 843, pl. liii., fig. 3, male; *P. restricta, ib.*, Lep. Cey., i., p. 178, 1881; *P. volux*, Mab., Ann. Soc. Ent. Belg., 1883, p. lvi.; *P. clavata*, Staud, Iris., ii., p. 153, pl. ii., fig. 9, 1889.)

Male and female, 36-46 mm. Head, palpi, antennæ, thorax, legs, and abdomen blackish, thorax clothed with light fuscous hairs, palpi and abdomen mixed with whitish beneath, club of antennæ somewhat ochreous beneath. Forewings elongate, triangular, costa strongly arched, termen obliquely rounded; black, markings silvery white, hyaline; a broad transverse irregularly edged median band, from immediately beneath costa, slightly curved, and terminating on vein 1 at two-thirds from base; two sub-costal spots at two-thirds from base; a similar spot near termen, lying between veins 4 and 5; cilia blackish. Hindwings with termen somewhat crenulate; color and cilia as in forewings; basal and inner margin hairs light fuscous, darker basally. Under side of both wings light fuscous, darker basally; costa of hindwings dark fuscous, faintly purplish tinged; markings of upper side of forewings reproduced.

We have followed Elwes and Edwards in the synonym of this

species. The Australian form is Moore's *Restricta*, which varies very little, those from the more northern districts of Queensland being most constant.

Cardwell, Cairns, Cooktown, and Mackay, Queensland; India, Java, China, and Philippines; November to January.

13. Badamia, Moore.

Club of antennæ elongate, pointed, bent. Palpi ascending, terminal joint long, slender, slightly swollen near apex, obtusely pointed, porrected. Posterior tibiæ with all spurs. Forewings in male without stigma; 5 parallel to 4 and 6, equidistant. Hindwings 3 and 4 remote, 5 present.

Contains only the single species, recognised by the curious form of wings.

72. Badamia exclamationis, Fabr.

(*Papilio exclamationis*, Fab., Syst. Ent., p. 530, 1775; *P. ladon*, Cramer, Pap. Ex., iii., pl. cclxxxiv., fig. c., female; *Ismene thymbron*, Feld., Sitzb., Ak. Wiss. Math. Nat. Cl., xl., p. 461, Lep., p. 14, 1860.)

Male and female, 58-64 mm. Head, palpi, thorax, antennæ, and legs fuscous-ochreous, head more ochreous, palpi and thorax beneath whitish, antennæ yellowish-beneath near base, club reddish beneath. Forewings very elongate, costa arched, termen oblique, somewhat sinuate above anal angle; dark ochreous-fuscous, shining somewhat; basal hairs greyish; costa and inner margin broadly suffused with obscure greenish-white; markings semi-hyaline whitish; a cuneiform spot in middle of cell, absent in male, lower edge shortly produced; a triangular spot near base of veins 3 and 4, nearer to 4 than 5, represented in male by a small white spot; a large elongate upper edge excised, represented in male by a very elongate streak just below base of veins 3 and 4; an elongate streak lying on vein 1 beyond middle, absent in male; cilia dark fuscous. Hindwings with color as in forewings, termen strongly excised below middle and produced on vein 1; basal and inner marginal hairs grey-whitish, faintly bluish-tinged; cilia fuscous-whitish. Under side of wings grey-whitish, markings of upper side obscurely reproduced; base of forewings dark fuscous; a suffused elongate streak of dull whitish above inner margin beyond middle; hindwings with a somewhat suffused crescentric whitish mark at two-thirds from base, between veins 1 and 2; area around anal angle dark fuscous; cilia whitish, terminal half tinged with fuscous.

Sydney, Bulli, and Richmond River district, New South Wales; Mackay, Cairns, and Cooktown, Queensland; occurs also in India, Ceylon, and Tonga.

14. Hasora, Moore.

Club of antennæ elongate, pointed, bent. Palpi ascending, terminal joint long, slender, slightly swollen near apex, obtusely pointed, porrected. Posterior tibiæ with all spurs. Forewings in male sometimes with stigma; 1b distorted downwards near base, 5 parallel to 4 and 6, slightly nearer 6 at base. Hindwings: 3 and 4 closely approximated basally; 5 present.

An Indo-Malayan genus of moderate extent, somewhat allied to *Ismene*, Swanison, differing, however, by the curious distorting of vein 1b. The pale spots of forewings are much more distinctly developed in female than in male; in fact, in some species the latter sex are entirely devoid of markings on upper side.

1.	Forewings above without markings, except stigma	*Chromus*, male.
	Forewings above with 3 whitish spots	*Lucescens*, female.
2.	Wings beneath iridescent purplish without markings	*Lugubris*, male.
	Wings beneath blackish fuscous, with a few bluish-white spots ...	5
3.	Forewings above fuscous, without markings or stigma	*Bilunata*.
	Forewings above fuscous, with moderate stigma	6
4.	Hindwings beneath bluish-green transverse band, very broad, ochreous, entire	*Discolor*.
	Hindwings fuscous-lilac, transverse band moderate, interrupted at vein 1b	3
5.	Basal hairs brilliant golden-green...	*Doleschallii*.
	Basal hairs greenish	4
6.	Transverse band of hindwings broad, whitish, entire, not interrupted	*Hurama*.
	Transverse band of hindwings narrow, pure white, interrupted at vein 1b	1

73. Hasora bilunata, Butl.

(? *Hasora haslia*, Swinh., Ann. Mag. N.H., iii. (7), 107.)

Male and female, 50-60 mm. Head, palpi, and thorax dark fuscous, mixed with metallic greenish hairs. Abdomen and antennæ dark fuscous, abdomen somewhat purplish tinged, palpi beneath ochreous, club of antennæ reddish beneath. Legs fuscous. Forewings elongate, triangular, costa gently arched, termen hardly rounded, oblique; dark fuscous, somewhat tinged with greenish-golden; basal hairs bluish-green; spots whitish, semi-hyaline; all markings in male absent; stigma absent; a small round subcostal spot at two-thirds from base between veins 6 and 7; an irregular triangular spot lying between veins 3 and 4 beyond middle; a similar spot obliquely below, between veins 2 and 3, touching vein 3; cilia dark fuscous. Hindwings with color as in forewings, termen produced on vein 1; basal and inner marginal hairs metallic blue-green, fuscous posteriorly; cilia as in forewings. Underside of both wings ochreous-fuscous, lighter in cell and along termen; markings of upper side of female reproduced, and with a suffused whitish spot on vein 1b; beyond subcostal spot is a short suffused obscure transverse whitish streak, hardly traceable in male; hindwings with faintly curved transverse snow-white fascia, narrowed at commencement and gradually dilated to termination from costa at three-fifths direct to vein 1a above anal angle; a large dull blackish apical patch; a moderate suffused, whitish patch on inner margin above anal angle; cilia dark fuscous, with a short streak of white at base on either side of anal angle.

Somewhat allied to the following, but very distinct by the much narrower fascia of hindwings, more sombre coloring, and especially by the absence of stigma of male. It closely resembles *Chromus*, but differs by the presence of stigma, larger size, and spot on vein 1b.

Brisbane; Queensland, in November.

74. Hasora lucescens, Lucas.

(*Ismene lucescens*, Lucas, Proc. Roy. Soc., Queensland, vol. xv., p. 138, 1899.)

Male and female, 42-48 mm. Head, thorax, and abdomen dark fuscous, more or less densely clothed with greenish hairs. Palpi and antennæ dark fuscous, palpi beneath ochreous. Legs ochreous-fuscous. Forewings elongate, triangular, costa gently arched, termen nearly straight, oblique; dark velvety-fuscous; basal hairs greenish; markings white, semi-hyaline; absent in male; a somewhat triangular shaped spot near base

of veins 3 and 4; a similar spot, excised posteriorly obliquely below, between veins 2 and 3; stigma of male narrow, curved, blackish, from inner margin before middle, thence curved round to base of vein 3, suffusedly edged with blackish; sometimes a very minute white subcostal spot between veins 6 and 7, generally absent; cilia dark fuscous, tips whitish. Hindwings with termen produced on vein 1; color as in forewings; basal hairs greenish; inner margin broadly dull light fuscous; cilia as in forewings. Under side of both wings fuscous, washed with bluish-purple; cell of forewings blackish; markings of upper side of female reproduced, hindwings with a moderately broad direct transverse white fascia, edges suffused, and mixed with bluish, from costa at three-fifths to vein 1b; a large patch of velvety black on anal angle; a white patch on inner margin just above anal angle; an obscure dull whitish streak along vein 1a to base; cilia as above, black on anal angle, and with a fine white basal line between veins 1b and 3.

Cooktown and Cairns, Queensland; in October and December. The types came from Cairns. In the original description no mention is made of the stigma of male. It could easily be passed over, as it is somewhat hidden by the long basal hairs.

75. Hasora discolor, Felder.

(*Goniloba discolor*, Feld., Wien. Ent. Mon., iii., p. 405, n. 50, 1859; *Ismene discolor*, *ib.*, Reise. Nov. Lep., iii., taf. 72, f. 17, 1867.)

Male and female, 40-48 mm. Head, thorax, and abdomen dark fuscous densely clothed with metallic-green hairs, palpi and antennæ dark fuscous, palpi, thorax, and abdomen beneath blue-green; legs fuscous. Forewings elongate, triangular, costa gently arched, termen gently bowed, oblique, dark fuscous-golden; basal hairs metallic-blue-green; stigma absent; cilia dark fuscous. Hindwings with termen produced on vein 1; color and basal and inner marginal hairs as in forewings; a tuft of long metallic-blue hairs on inner margin above anal angle; cilia as in forewings, but becoming black from vein 1b, around inner margin. Under side of both wings blue-black, becoming olive-greenish on hindwings on basal half; markings of forewings golden-greenish; a slightly outwards curved narrow transverse fascia; from five-sixths of costa to anal angle; a broad transverse fascia from middle of costa to beyond middle of inner margin, becoming lilacine on lower fourth and enclosing a large spot of ground color beneath costa; inner margin broadly light fuscous; hindwings with a broad yellowish trans-

verse fascia, broadly in middle, from costa just before apex direct to vein 1b; a bluish metallic patch on inner margin above anal angle; a greenish-golden hind-marginal line, rather narrow, with a slight projection on vein 2 and terminating before anal angle; cilia as above.

A beautiful insect when fresh, especially the under side; it differs from all the other known Australian species by the different color of band of under side of hindwings.

Brisbane, Mackay, and Cooktown, Queensland; Richmond River district, New South Wales; in December.

76. Hasora lugubris, Boisd.

(*Thymele lugubris*, Bdv., Voy. Astr. Lep., p. 160, No. 5, 1832.)

Male, 52 mm. Head, thorax, palpi, antennæ, legs, and abdomen fuscous, palpi, thorax, and abdomen yellowish beneath. Forewings elongate, triangular, costa gently arched, termen hardly bowed, nearly straight, oblique; ochreous-fuscous; an irregularly suffused, outwardly oblique blackish stigma, from just beyond one-third of inner margin to base of cell 3; cilia ochreous-fuscous. Hindwings with termen produced on vein 1; color and cilia as in forewings; basal and inner marginal hairs ochreous-fuscous. Under side of both wings ochreous-fuscous, more or less suffused with metallic-purple, especially hindwings; base below cell and along inner margin ochreous-fuscous; faint indications of a sub-median transverse whitish-purple fascia.

The absence of markings and purple coloring of under side of wings are notable characteristics.

Cape York, Queensland; one specimen, in December.

77. Hasora hurama, Butler.

(*Hesperilla hurama*, Butler, T.E. Soc., p. 498, 1870; Lepid. Ex., p. 166, t. 59, fig. 10, 1874; *Ismene hurama*, *Misk.*, Ann., Queensland Mus., p. 74, 1891.)

Male and female, 48-54 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark fuscous, head and thorax mixed with greenish-metallic hairs, palpi beneath ochreous. Forewings elongate, moderate, costa gently arched, termen slightly rounded near apex, thence oblique; dark purplish fuscous; basal hairs greenish-golden; without markings; stigma of male formed by blackish seam-like scales, from before middle of inner margin to base of vein 3; cilia dark fuscous. Hindwings with termen produced on vein 1, color, basal hairs and cilia as in

forewings; inner margin clothed with long fuscous hairs. Under side of forewings fuscous, purplish tinged between termination of cell and termen, more pronounced in female; cilia as above. Under side of hindwings fuscous, wholly suffused with iridescent purple; a broad transverse white entire fascia, broadest in middle, posterior edge straight, anterior edge somewhat projecting in middle, from three-fourths of costa direct to vein 1b, thence deflected to inner margin above anal angle; a suffused blackish blotch on anal angle; cilia as above, but becoming whitish at base between veins 1 and 2.

Distinct by the broad entire fascia of under side of hindwings.

Watson (P.Z.S., 1893) spells this *Hurana*.

Cooktown, Cardwell, and Mackay, Queensland; five specimens, November to February.

78. HASORA CHROMUS, Cramer.

(*Papilio chromus*, Cramer, Pap. Ex., iii., pl. cclxxxiv., fig. E., male, 1782; *Parata chromus*, Moore, Lep. Cey., i., p. 161, pl. lxv., figs. 1, a, b, 1881.)

Male and female, 40-48 mm. Head, palpi, antennæ, thorax, legs, and abdomen dark fuscous, palpi beneath faintly ochreous, collar greenish. Forewings elongate, triangular, costa gently arched, termen faintly rounded, oblique; dark fuscous, without markings; basal hairs fuscous; stigma of male formed as interneural streaks; cilia dark fuscous. Hindwings with termen produced on vein 1b; color, basal hairs, and cilia as in forewings. Under side of forewings dark fuscous; cilia as above. Under side of hindwings as forewings; a narrow, white, transverse fascia, posteriorly dilated, from costa at three-fourths direct to vein 1b, and there dilated; a small whitish patch on inner margin near termination of vein 1a; a large blackish patch on anal angle; cilia fuscous, becoming white at base between veins 1 and 2.

Varies somewhat in size and width of white band of under side of hindwings. Those which we possess from India and Ceylon show a tendency to be suffused with purplish on under side of hindwings. The species named *Lucescens* by Dr. Lucas has been confused with the present species. However, the totally different form of the stigma, which in the former is well developed and of raised crescentic form, is very different to that of *Chromus*, in which it appears (in Australian specimens) as short longitudinal raised interneural streaks. The broad band of hindwings of former is also a conspicuous character. Messrs. Elwes and Edwards give *Alexis*, Moore, and *Malayana*, Feld. as, synonyms.

Brisbane and Mackay, Queensland, in December; occurs also in India and Java.

79. Hasora doleschallii, Feld.

(*Ismene doleschallii*, Feld., Sitzb. Ak. Wiss. Wien. Math. Nat. Cl., xl., p. 460, 1860; Reise. Nov. Lep., iii., t. 72, fig. 16, 1867.)

Female 50 mm. Head and palpi greenish-golden. Thorax, antennæ, legs and abdomen dark fuscous, thorax and anterior half of abdomen clothed with golden-greenish hairs, thorax beneath bluish-green. Forewings elongate, triangular, costa gently arched, termen gently rounded, oblique; dark fuscous; basal fourth of wing clothed with golden-green hairs, cilia dark fuscous. Hindwings with termen prominent on vein 1, not produced; dark fuscous; basal and inner marginal hairs golden-green, becoming bluish posteriorly; cilia as in forewings. Forewings beneath fuscous; markings whitish; a small spot in middle of cell; a second similar near base of veins 3 and 4; a short transverse lilacine streak from vein 1 beyond middle to near vein 3, its apex directly between first 2 spots, but not quite reaching them. Hindwings blackish-fuscous; a small bluish-white spot in cell near base; a moderate bluish-white spot two-thirds from base, between veins 1 and 2; cilia dark fuscous, becoming snow-white at base from anal angle to vein 3, but interrupted at extremities of veins.

A very beautiful species; remarkable for the paucity of markings on both upper and under sides of wings.

Cooktown, Queensland; two specimens in December. Occurs also in New Guinea and Molucca.

List of Unrecognised and Reputed Australian Species.

80. *amalia*, Semp. (*Pamphila*) (Mus. Godf. Lep., XIV., p. 183, 1878). Rockhampton.

81.**ancilla*, Herr-Sch. (*Pamphila*) (Stett. Ent. Zeit., p. 79, n. 59, 1869). Rockhampton.

82. *argeus*, Plotz. (*Hesperilla*) (Stett. Ent. Zeit., XLIV., p. 227, 1883). Cape York.

83. *argina*, Plotz. (*Pyrgus*) (*l.c.*, XLV., n. 22, 1884). Brisbane.

84. *atrax*, Mab. (*Hesperilla*) (Comp. Rend. Ent. Belg., XXXV., p. lxxxi.). Australia.

85. *augiades*, Feld. (*Pamphila*) (Sitzb. Ak Wien M. N., cl. XV., p. 461, n. 51, 1860. Reis Nov. Lep. III. t. 72, f. 5, 1867). Probably recorded in error for *sperthias*, Feld.

86. *australensis*, Mab. (*Tagiades*) (Comp. Rend. Ent. Belg., XXXV., p. lxxii.). Australia.

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* This is probably *Telicota augias*, Linn.

87. *bifasciata*, Tepp. (*Hesperilla*) (Tr. Roy. Soc., S.A., IV., p. 32, t. 2, f. 4, 1881). Lyndoch, S. Australia.

"Clear brown, with four oval yellow spots near the margin (termen), three similar near base, and a semilunar one between them and edge (costa). A double band—the outer *white*, the inner yellow—margins the posterior wings, and a small round yellow spot near base."

Mr. Tepper has supplied us with an exeellent colored drawing of this species. The band of hindwings is a characteristic feature. The type, unfortunately, has been lost.

87A. *colaca*, Moore (*Pornara*) (P.Z.S., 1877, p. 594, pl. lviii., fig. 7).

M, Rowland Turner, of Mackay, has informed us that he has taken this species in the above district. Specimens were submitted to M. DeNiceville, who stated that they were exactly the same as Indian specimens.

88. *contempta*, Plotz. (*Ismene*) (Stett. Ent. Zeit., XLV., p. 56, 1884). Cape York.

89. *dolon*, Plotz. (*Apaustus*) (*l.c.*, XLIV., p. 166, 1884). Australia.

90. *eaclis*, Mab. (*Hesperilla*) (C.R. Ent. Belg., p. 63, 1883). Australia.

91. *extranea*, Plotz. (*Telesto*) (Stett. Ent. Zeit., p. 383, 1884). Australia.

92. *impar*, Mab. (*Pamphila*) (C.R. Ent. Belg., p. 46, 1883). Australia.

93. *indusiata*, Mab. (*Hypoleucis*) (*l.c.*, XXXV., p. cxiii.). Victoria.

94. *lagon*, Mab. (*Pamphila*) (*l c.*, p. lxxxii.). Cooktown.

95. *leucopogon*, Mab. (*Proterodes*) (*l.c.*, p. cxi.). Victoria.

96. *melissa*, Mab. (*Hesperilla*) (*l.c.*, p. lxxxi.). Australia.

97 *neocles*, Mab. (*Pamphila*) (*l c.*, p. clxviii.). Cooktown.

98. *nox*, Mab. (*Pamphila*) (*l.c.*, p. clxviii). Victoria.

99. *phineus*, Cr, (? *Eryrnnis*) (Pap. Ex., II., t. 176, E. 1779). Recorded probably in error.

100. *rectivitta*, Mab. (*Pamphila*) (Pet. Nouv. Ent., II., p. 237, 1878). Australia (?).

101. *Rietmanni*, Semp. (*Hesperilla*) (Mus. Godf. Lep, XIV., p. 187, 1878). Sydney.

102. *satulla*, Mab. (*Hesperilla*) (C.R. Ent. Belg., XXXV., p. lxxxii.). Australia.

103. *saxula*, Mab. (*Hesperilla*) (*l.c.*, p. lxxxi.). Australia.

104. *sigida*, Mab. (*Pamphila*) (*l.c.*, p. clxviii). Australia.

105. *tyrrhus*, Mab. (*Toxidia*) (*l.c.*, p. lxxx.). Cooktown.

106. *vallio*, Mab. (*Carystus*) (C.R. Ent. Belg., LX., p. 27, 1883). New Holland.

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Descriptions of New Species of Fossil Mollusca from the Miocene Limestone near Edithburg.

(Including Notes by the Late Professor Ralph Tate.)

By Herbert Basedow.

[Read June 3, 1902.]

Plate II.

On July 2, 1901, I read, at a meeting of this Society, a paper "On the Occurrence of Miocene Limestones at Edithburg, &c.," containing in an appendix a list of fossil mollusca, some of which were marked as new species, with MS. names.

The late Professor Ralph Tate had kindly promised to describe the new species I had obtained from this neighborhood, but owing to his lamented death this promise was but partially fulfilled. In this paper I submit descriptions of the species marked as new in that appendix, which include (where indicated) the work of the late Professor as far as he had advanced up to the time of his death.

Campanile triseriale, spec. nov. Pl. ii., fig. 1.

Shell large, solid, tapering; about 14 flattened whorls, rapidly widening anteriorly; constricted at the suture.

The characteristic ornamentation of the whorls consists of three well-defined, elevated, coarsely-granulose ribs, the posterior of which being the most coarsely and the median the least coarsely granulose. The obliquity of the granulations of the respective ribs varies from almost nil in the posterior rib (the granules being approximately circular in section) to about half a right angle in the anterior rib (the granules narrowly oval). The interspaces between the granular ribs are in general ornamented by a set of fine, equally strong spiral threads, while the space between the anterior and median ribs is conspicuously divided by a very much stronger thread. Base flattened, angulated at the edge and finely decorated by successive lines of growth. Aperture and apex fractured.

Dimensions of Type.—Length, 85 mm. (apex wanting); breadth, 33 mm.

Locality.—Subcrystalline miocene limestone near Edithburg; also miocene limestone at Hallett's Cove.

Remarks.—In general shape of whorls and outline this fossil species comes near to large examples of *C. laeve*, Q. and G., now living in Western Australian waters, although the two very distinctive ornamentations are hardly comparable.

In the Catalogue of Tertiary Mollusca of the British Museum, part I, p. 228, Mr. G. F. Harris, F.G.S., writes: "Cast of a large species of *Cerithium*, probably referable to the subgenus *Campanile* from Kadina, South Australia." This species mentioned by Mr. Harris will no doubt be referable to *C. triseriale*.

MERETRIX SPHERICULA, spec. nov. Pl. ii., fig. 2.

Shell solid, triangularly orbicular, slightly inequilateral, a little wider than high. Surface ornamented with rather coarse, irregular lines of growth and fine concentric threads, and also (more distinctly visible on the partially denuded portions) by faint radial striæ. Umbones small, depressed, curved over towards the front, apparently somewhat oblique. Lunule prominent, lanceolate. Ventral margin smooth and regularly curved. Both valves much inflated and regularly convex, thus effecting, with united valves, a globose, more or less spherical appearance. Interior unknown.

Dimensions of Type.—Antero-posterior diameter 74, umbo-ventral diameter 67, sectional diameter of united valves 50 millimeters.

Locality.—Subcrystalline miocene limestone about Edithburg.

Large, imperfect casts, referable to this species, as large as 95 millimeters antero-posterior, and 91 umbo-ventral diameter, have also been found in the miocene cliffs at Aldinga Bay and Hallett's Cove.

CARDIUM MEDIOSULCATUM (Tate and Basedow), spec. nov. Pl. ii., fig. 3.

Cardium rotundly oval, a little higher than wide, moderately convex, equilateral and equivalve. Umbos central, approximate, depressed. Surface ornamented with from 33 to 37 elevated, truncated ribs, narrower than the interspaces (3 in a width of 5 mm. in medio-ventral area). Ribs with a medio sulcus, here and there interrupted by obsolete, depressed,

vaulted scales. Interspaces flat, twice as wide as the ribs, traversed by curved imbricating lamellæ.

Interior unknown.

Dimensions of Type.—Antero-posterior diameter 40, umbo-ventral diameter 41, sectional diameter of united valves 25 millimeters.

Locality.—Subcrystalline miocene limestone near Edithburg, Yorke's Peninsula.

Remark.—Whether the presence of a medio-sulcus in the ribs can be ascribed to a primary characteristic of the mollusc or to a feature subsequently produced by fossilization remains to be proved.

CARDITA DENNANTI (Tate and Basedow), spec. nov. Pl. ii., fig. 4.

Shell ovately triangular, transverse, inequilateral, moderately solid; umbos prominent, obtuse, antemedian, incurved. Post-dorsal margin inclined, antero-dorsal margin cordate.

Surface ornamented with 23 wide truncated ribs (1 mm. wide in medio-ventral area), which are plain and slightly margined at the sides. The intervening flat furrows, narrower than the ribs, are traversed by somewhat distant, transverse threads, which cross the ribs.

Dimensions of Type.—Antero-posterior diameter 13; umbo-ventral diameter 11 mm.

Locality.—Subcrystalline miocene limestone near Edithburg, Yorke's Peninsula.

Imperfect specimens of this species have also been found in the miocene limestone at Hallett's Cove.

The species is named after J. Dennant, Esq., Camberwell, in recognition of invaluable palæontological services rendered.

GLYCIMERIS SUBRADIANS (Tate), spec. nov.

This species is of same general outline as *G. radians*, Lk., but differs by being flatter and having its radial ribs more acutely elevated, the interspaces being as wide. The radial ornamentation, moreover, is obsolete on the lateral slopes.

Locality.—Common in the miocene limestone at Hallett's Cove; also in the subcrystalline miocene limestone near Edithburg.

DESCRIPTION OF PLATE II.

Figure 1. *Campanile triseriale*, spec. nov.
" 2. *Meretrix sphericula*, spec. nov.
" 3. *Cardium mediosulcatum* (Tate and Basedow), spec. nov.
" 4. *Cardita Dennanti* (Tate and Basedow), spec. nov.

(All figures of natural size).

Descriptions of New Species of Lepidoptera (Œcophoridæ).

By E. Meyrick, B.A., F.Z.S.

[Read July 1, 1902.]

When I issued my paper on Australian *Œcophoridæ* (Proc. Linn. Soc., N.S.W., 1882-1888) I excluded from consideration certain small groups of genera which I at that time thought capable of being maintained as separate families. Subsequent investigations have led me (as shown in my "Handbook of British Lepidoptera) to prefer to treat them as more or less aberrant portions of the same family, and I, therefore, now describe the Australian genera and species of those groups, and also take the opportunity of dealing at the same time with some undescribed species of the other genera of the family, with which I have become acquainted since the publication of my paper. In addition to these, Mr. O. Lower and Dr. A. J. Turner have described a considerable number of fresh species, of many of which I possess types through the liberality of these gentlemen. Of these I will only say at present that they appear to me to be in general well grounded and efficiently described.

The order of genera here followed is that which (in accordance with the principles of my handbook) I should now use to express their affinities. My views on the affinities themselves have undergone little change, the difference being one of the mode of expression only.

MACHÆRITIS, Meyr.

Machæritis pelinopa, n. sp.

Male, 11-13 mm. Head and thorax pale whitish-ochreous. Palpi ochreous-whitish, second joint externally sprinkled with dark fuscous. Antennæ ochreous-whitish, ringed with dark fuscous. Abdomen whitish-ochreous. Legs dark fuscous, ringed with ochreous-whitish, hairs of posterior tibiæ pale whitish-ochreous. Forewings elongate, narrow, costa moderately arched, apex pointed, termen very obliquely rounded; whitish-ochreous, more or less irrorated with fuscous (in one specimen very slightly); cilia pale whitish-ochreous, towards base sprinkled with fuscous. Hindwings grey, lighter anteriorly; cilia whitish-grey-ochreous.

Launceston, Deloraine, and Hobart, Tasmania, from November to January; three specimens. Intermediate between *M. indocta* and *ægrella*, differing from both by entire absence of stigmata.

MACHÆRITIS NAIAS, n. sp.

Male, 11 mm. Head and thorax white. Palpi white, second joint externally dark fuscous. Antennæ grey. Abdomen grey, anal tuft whitish-ochreous. Legs dark fuscous, hairs of posterior tibiæ whitish-ochreous. Forewings elongate, narrow, costa moderately arched, apex acute, termen extremely obliquely rounded; white; extreme costal edge dark fuscous basally; markings pale brownish irrorated with dark fuscous; stigmata moderate, round, plical directly beneath first discal, second discal confluent with a small terminal spot beyond tornus to form a bar; a small dorsal spot before tornus; some scattered dark scales in disc between these markings; two small spots (tending to be obsolescent) on costa towards apex; cilia white, partially sprinkled with dark fuscous. Hindwings pale grey; cilia whitish.

Mount Crackenback (Kosciusko Range), New South Wales, at 4,700 ft., in January; one specimen.

Allied to *M. melanospora* and *samphoras*, but quite distinct.

OCYSTOLA, Meyr.

OCYSTOLA POLEMISTIS, n. sp.

Male, 11 mm. Head shining bronzy. Palpi rather long, ochreous-yellowish, terminal joint externally dark fuscous, three-fifths of second. Antennæ yellowish, ringed with dark fuscous, ciliations 2½. Thorax dark bronzy-fuscous, tips of patagia yellow. Abdomen dark fuscous, anal tuft yellowish. Legs dark fuscous, ringed with yellowish, hairs of posterior tibiæ yellowish. Forewings elongate, slightly dilated posteriorly, costa gently arched, apex round-pointed, termen hardly rounded, rather strongly oblique; orange-yellow; a narrow dark fuscous costal streak from base, confluent with a large dark purplish-fuscous patch occupying terminal half of wing, its anterior edge convex and running from middle of costa to three-fifths of dorsum; cilia dark purplish-fuscous, beneath apex with an ochreous patch. Hindwings and cilia dark fuscous; 3 and 4 connate.

Brisbane, Queensland; one specimen. Allied to *O. placoxantha* and *mesoxantha*. Differs from the former by the absence of the posterior yellow spot, from the latter by the dark fuscous costal streak, from both by the strongly convex edge of terminal dark patch.

OCYSTOLA MISTHOTA, n. sp.

Female, 13 mm. Head and palpi whitish-ochreous, palpi long, terminal joint almost 1. Antennæ grey. Thorax bronzy-fuscous. Abdomen broken. Legs whitish-ochreous, partially suffused with bronzy-fuscous. Forewings elongate, somewhat narrowed posteriorly, costa moderately arched, apex pointed, termen very obliquely rounded; yellow; markings rather dark fuscous, faintly purplish-tinged; a costal streak from base to near middle, extended at base to dorsum, apex attentuated, not quite reaching posterior patch; a large patch occupying terminal half of wing, its anterior edge straight and running from middle of costa to middle of dorsum; cilia rather dark fuscous. Hindwings coppery-fuscous, darker towards apex; cilia rather dark coppery-fuscous; 3 and 4 connate.

Sydney, New South Wales, in February (G. H. Raynor); one specimen.

Allied to *O. placoxantha* and the preceding, but characterised by the pale head, long terminal joint of palpi, costal streak not reaching band, &c.

OCYSTOLA CHRYSOPIS, n. sp.

Male, 12-13 mm. Head orange. Palpi long, dark fuscous, second joint orange-yellow internally and on apical half externally, terminal joint almost 1. Antennæ dark fuscous, ciliations 2½. Thorax and abdomen dark fuscous. Legs yellow, tarsi and anterior and middle tibiæ mostly dark fuscous above. Forewings elongate, narrow, costa moderately arched, apex round-pointed, termen very obliquely rounded; orange; markings dark purplish fuscous; a rather broad costal streak from base to middle, extended at base to dorsum, posteriorly attenuated and finely connected with posterior patch; a small spot representing first discal stigma, confluent above with costal streak; a large patch occupying terminal half of wing, its anterior edge slightly convex, and running from just beyond middle of costa to three-fifths of dorsum, enclosing a few yellow scales in disc at two-thirds; cilia dark fuscous, on termen yellow, basal third blackish. Hindwings dark coppery-fuscous, rather lighter anteriorly; cilia dark fuscous, with a basal blackish shade; 3 and 4 connate.

Sydney, New South Wales, in November and April (G. H. Raynor, G. Lyell); two specimens.

Near the preceding, but distinguished from all the allied species by the projection from the costal streak, representing first discal stigma, and the orange head.

Ocystola æthopis, n. sp.

Male, 11-14 mm. Head grey, slightly reddish-tinged. Palpi moderately long, fuscous, terminal joint almost 1. Antennæ fuscous, ciliations (5). Thorax brown. Abdomen fuscous. Legs rather dark fuscous, hairs of posterior tibiæ ochreous-grey-whitish. Forewings elongate, moderate, costa gently arched, apex round-pointed, termen very obliquely rounded; dull brown, slightly reddish-tinged, especially on costal edge; stigmata large, darker, very cloudy and ill-defined, plical obliquely beyond first discal; termen very obscurely darker suffused; cilia dull brown, with an obscure, sometimes obsolete, patch of ochreous suffusion towards tips beneath apex. Hindwings and cilia rather dark grey; 3 and 4 connate.

Gisborne, Victoria, in October and March (G. Lyell); two specimens.

Nearly allied to *O. acroxantha*, but conspicuously darker throughout, and without the yellow cilia of that species.

Ocystola holoxantha, n. sp.

Male, 14 mm. Head, palpi, and thorax bright yellow; palpi rather short, terminal joint two-thirds. Antennæ grey, towards base anteriorly white, ciliations (5). Abdomen grey, mixed with ferruginous, segmental margins whitish. Legs dark grey, hairs of posterior tibiæ whitish. Forewings elongate, moderate, costa moderately arched, apex round-pointed, termen extremely obliquely rounded; bright clear golden-yellow; cilia yellow. Hindwings pale grey, darker posteriorly; cilia yellowish-grey-whitish; 3 and 4 connate.

Closely related to *O. malacella*, but immediately distinguished by the grey hindwings (in *malacella* these are ochreous-whitish, without any grey tinge).

Bathurst, New South Wales, in November; one specimen.

HESPEROPTILA, n. g.

Head smooth-scaled, side tufts loosely spreading; tongue developed. Antennæ three-fourths, in male moderately ciliated (1), basal joint moderate, with pecten. Labial palpi moderately long, recurved, second joint not reaching base of antennæ, somewhat roughened beneath, terminal joint somewhat shorter than second, moderate, acute. Thorax smooth-scaled. Posterior tibiæ clothed with long hairs above. Forewings: 2 from near angle of cell, 7 and 8 stalked, 7 to termen; surface with tufts of raised scales. Hindwings almost 1, elongate-ovate, cilia 1; 3 and 4 connate.

Only differs from *Coesyra* by the raised scale tufts of forewings. It may be regarded as a derivative of the earlier forms of that genus, and placed next *Heterozyga*.

HESPEROPTILA ARIDA, n. sp.

Male, 13 mm. Head and thorax grey-whitish irrorated with fuscous. Palpi white, second joint irrorated with dark fuscous except at apex and on a supramedian ring, terminal joint with supramedian band of dark fuscous irroration. Antennæ grey. Abdomen whitish-ochreous. Legs whitish, irrorated with dark fuscous except at apex of joints, hairs of posterior tibiæ white. Forewings elongate, rather narrow, costa moderately arched, apex acute, termen extremely obliquely rounded; grey-whitish, suffusedly irrorated with brown and irregularly sprinkled with dark fuscous; a spot of irroration on fold at one-fourth; stigmata dark fuscous, first discal and plical forming raised tufts, plical slightly beyond first discal, second discal small; cilia whitish, sprinkled with brownish-ochreous and dark fuscous. Hindwings ochreous-whitish, obscurely infuscated except towards base; cilia ochreous-whitish, basal half more ochreous-tinged.

Carnarvon, West Australia, in October; one specimen.

CŒRANICA, Meyr.

CŒRANICA ANTICHROMA, n. sp.

Male, 19 mm. Head and thorax orange-yellow, face dark fuscous. Palpi dark fuscous, above whitish. Antennæ dark fuscous, above towards base white. Abdomen and legs dark fuscous, hairs of posterior tibiæ paler and yellowish-tinged. Forewings elongate, costa moderately arched, apex obtuse, termen obliquely rounded; deep yellow; cilia ochreous-yellow. Hindwings dark fuscous; cilia ochreous, base mixed with grey.

Healesville, Victoria (J. A. Kershaw); one specimen. The absence of markings at once distinguishes this from the other two species of the genus.

PSALTRIODES, n. g.

Head smooth; tongue developed. Antennæ five-sixths, in male biciliated with very long fascicles (7), basal joint short, stout, with partial pecten. Labial palpi short, subascending, second joint only reaching middle of face, with short rough projecting scales beneath, terminal joint very short, less than half second, slender, acute. Thorax smooth. Forewings: 2 from angle of cell, 7 and 8 stalked, 7 to termen. Hindwings 1, elongate-ovate, cilia one-half; 3 and 4 connate.

Allied to *Aristeis*, from which it appears to be sufficiently distinguished by the rough scales of second joint of palpi, and antennal pecten.

PSALTRIODES THRIAMBIS, n. sp.

Male, 14 mm. Head, thorax, and abdomen bronzy-fuscous, segmental margins yellowish. Palpi white, second joint externally yellowish-tinged. Antennæ dark fuscous. Legs dark fuscous, ringed with yellow-whitish (posterior pair broken). Forewings elongate, slightly dilated, costa somewhat bent towards base and towards apex, apex round-pointed, termen straight, oblique; bronzy-fuscous, evenly irrorated with whitish and irregularly sprinkled with blackish; stigmata blackish-fuscous, plical directly beneath first discal; an indistinct curved subterminal series of blackish-fuscous dots, indented beneath costa; cilia rather dark fuscous, basal half fuscous-whitish, with a dark fuscous basal line. Hindwings orange; a terminal dark fuscous fascia, dilated at apex so as to occupy two-fifths of wing; cilia fuscous, with a dark fuscous basal line.

Duaringa, Queensland, in August (G. Barnard); one specimen.

ARISTEIS, Meyr.

ARISTEIS HEPIALELLA, Walk.

(*Oecophora hepialella*, Walk., Cat. Tin., 1033.)

Townsville, Queensland; bred by Mr. F. P. Dodd. I possess a specimen by the kindness of Dr. A. J. Turner, who will redescribe it.

CŒSYRA, Meyr.

CŒSYRA KERSHAWI, Low.

(*Cœsyra Kershawi*, Low., Trans. Roy. Soc., South Austr., 1893, 293.)

Male and female, 16-19 mm. Head yellow. Palpi yellow, base dark fuscous. Antennæ fuscous. Thorax shining dark purplish-fuscous, posterior extremity yellow. Abdomen rather dark fuscous. Legs dark fuscous ringed with whitish-ochreous, hairs of posterior tibiæ whitish-yellowish. Forewings elongate, moderate, costa gently arched, apex obtuse, termen slightly sinuate, oblique; bright deep yellow; base narrowly purple-fuscous, outer edge vertical; a dark fuscous mark along costa at one-third; a large terminal purple-fuscous patch, becoming dark fuscous on edges, anterior edge from three-fifths of costa to two-thirds of dorsum, bisinuate, enclosing a small suffused yellow costal spot near anterior edge;

cilia fuscous, basal half mixed with dark fuscous. Hindwings bronzy-fuscous, darker posteriorly; cilia bronzy-fuscous.

I describe this species here as some of the characteristic points are omitted in Lower's description. I have received authentic types from Mr. A. J. Kershaw, the original captor, and also took the species myself at Glen Innes (3,500 ft.), New South Wales, in December. It is well distinguished from *C. dichroella* by the dark fuscous costal mark at one-third, yellow costal spot in terminal band, and absence of yellow patch in terminal cilia.

CŒSYRA MIMOPA, n. sp.

Male, 16 mm. Head ochreous-yellow. Palpi ochreous-yellow, lower half of second joint dark fuscous. Antennæ dark fuscous. Thorax dark purplish fuscous. Abdomen fuscous. Legs dark fuscous, posterior tibiæ ochreous-yellowish. Forewings elongate, costa moderately arched, apex obtuse, termen obliquely rounded; shining ochreous-yellow; base narrowly rather dark fuscous, shortly produced on costal edge; a dark fuscous-purple terminal fascia, anterior edge running from six-sevenths of costa to before tornus, bisinuate; cilia shining fuscous. Hindwings bronzy-fuscous; cilia fuscous.

Halbury, South Australia, in February (E. Guest); one specimen. May be placed between *C. seleniaca* and *C. isogramma*, but by no means closely approaching either, the peculiar form of the terminal fascia being characteristic.

CŒSYRA COLONÆA, n. sp.

Male, 18 mm. Head and thorax ochreous-yellow, shoulders dark fuscous. Palpi dark fuscous, terminal joint whitish. Antennæ fuscous. Abdomen pale grey, anal tuft pale yellowish. Legs dark grey, hairs of posterior tibiæ whitish-yellowish. Forewings elongate, costa gently arched, apex round-pointed, termen extremely obliquely rounded; pale ochreous-yellow, slightly infuscated posteriorly; base of costa dark fuscous; cilia pale ochreous-yellow. Hindwings grey; cilia ochreous-whitish, faintly greyish-tinged round apex.

Bathurst, New South Wales, in November; one specimen.

Closely allied to *C. panxantha*, but distinguished by the grey hindwings. It therefore bears exactly the same relation to *C. panxantha* that *Ocystola holoxantha* (from the same locality) does to *O. malacella*.

CŒSYRA MICROSTICTIS, n. sp.

Male, 11 mm. Head and thorax whitish-ochreous, shoulders narrowly irrorated with dark fuscous. Palpi whitish,

second joint externally yellowish, basal three-fifths dark fuscous. Antennæ grey. Abdomen whitish-ochreous. Legs fuscous, ringed with ochreous-whitish, hairs of posterior tibiæ ochreous-whitish. Forewings elongate, costa moderately arched, apex round-pointed, termen very obliquely rounded; whitish-ochreous; basal one-fourth of costa suffused with dark fuscous; stigmata small, black, plical slightly beyond first discal; a small black prætornal dot beneath second discal; an angulated subterminal series of minute black dots close to termen and apical one-third of costa; cilia whitish-ochreous, with a few blackish points. Hindwings whitish-grey; cilia ochreous-whitish.

Bathurst, New South Wales, in March; one specimen.

Allied to *C. arenivaga*, but differing by the hardly obliquely placed plical stigma and additional prætornal dot and subterminal series.

CŒSYRA DISCINCTA, Meyr.

(*Gelechia strophiopeda*, Low., Trans. Roy. Soc., S. Austr., 1894, 105, is a synonym of this. I have seen the type. The groundcolor should be described as whitish-ochreous, my examples being somewhat faded.)

ATHEROPLA, Meyr.

ATHEROPLA CHORIAS, n. sp.

Male, 13 mm. Head and thorax ochreous-yellow, shoulders fuscous. Palpi ochreous-yellow, second joint fuscous except towards apex. Antennæ pale ochreous. Abdomen grey. Legs dark fuscous, posterior pair grey-whitish. Forewings elongate, slightly dilated, costa moderately arched, apex rounded, termen very obliquely rounded; deep ochreous-yellow, with a few fuscous scales; base of costa dark fuscous; stigmata blackish-fuscous, plical obliquely beyond first discal, an additional dot above and between two discal, second discal larger; a broad rather dark fuscous terminal fascia, anterior edge suffused, with a projection touching second discal stigma beneath, enclosing a terminal series of small suffused ochreous-yellow spots; cilia fuscous, suffusedly pale yellowish towards tips beneath apex. Hindwings rather dark fuscous; cilia fuscous.

Sydney, New South Wales, in October (G. H. Raynor); one specimen. The dark fuscous hindwings and terminal fascia of forewings, and the additional median dot, separate this species at once.

PELTOSARIS, n. g.

Head smooth; tongue developed. Antennæ five-sixths, in male with very long ciliations (7), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint exceeding base of antennæ, clothed with dense scales expanded into tuft beneath towards apex, terminal joint almost as long as second, slender, acute. Thorax smooth. Forewings: 7 and 8 stalked, 7 to termen. Hindwings under 1, elongate-ovate, cilia three-fourths; 3 and 4 connate.

Allied to *Hypercallia*, of which it may be regarded as a development, differing essentially by the tufted second joint of palpi.

PELTOSARIS TRIPLACA, n. sp.

Male, 13-14 mm. Head ochreous-yellowish, sometimes centrally infuscated. Palpi ochreous-yellowish, second joint with broad oblique dark fuscous band, terminal joint dark fuscous. Antennæ yellowish, ringed with dark fuscous. Thorax dark fuscous, collar and patagia ochreous-yellow. Abdomen dark fuscous. Legs dark fuscous, ringed with yellowish (posterior pair broken). Forewings elongate, costa moderately arched, apex round-pointed, termen hardly rounded, very oblique; ochreous-yellow; edge of costa at base dark fuscous; three broad connected dark fuscous fasciæ, first from dorsum before middle to middle of costa, sending a projection near dorsum to base, second connecting upper end of first with lower end of third, third terminal; cilia dark fuscous, on termen ochreous-yellow except at base. Hindwings and cilia dark fuscous.

Katoomba, New South Wales, in November (G. Lyell); two specimens.

HYPERCALLIA, Steph.

This names supersedes *Peltophora*, Meyr.

HYPERCALLIA TRICHROA, n. sp.

Male, 14 mm. Head ochreous-yellow. Palpi light ochreous-yellow, lower half of second joint dark fuscous. Antennæ dark fuscous, ciliations (9). Thorax dark purplish-fuscous. Abdomen dark fuscous, anal tuft yellowish. Legs dark fuscous, middle tarsi yellowish-ringed, posterior legs ochreous-yellowish, banded with fuscous. Forewings elongate, costa moderately arched, apex pointed, termen almost straight, oblique; dark fuscous, somewhat mixed with whitish-ochreous; two ochreous-whitish fasciæ, first at one-fourth, narrowed towards costa, very broad dorsally, second from two-thirds of

costa to tornus, dilated posteriorly in middle and on costa, enclosing a dark fuscous transverse mark in disc; a whitish-ochreous streak along upper two-thirds of termen; cilia dark fuscous, beneath tornus yellow. Hindwings bright orange; apical one-fifth dark fuscous; a narrow dorsal patch mixed with dark fuscous; cilia dark fuscous.

Yale Paddock, South Australia, in March (E. Guest); one specimen.

Allied to *H. helias*, from which it differs, besides distinctions of color, by the shorter palpi and much longer antennal ciliations.

PHILOBOTA, Mer.

Philobota argyraspis, Low.

(*Cœsyra argyraspis*, Low., Trans. Roy. Soc., S. Astr., 1897, 54.)

Male and female, 14-15 mm. Head orange. Palpi orange, irrorated with dark fuscous. Antennæ fuscous. Thorax orange-tawny, patagia pale ochreous posteriorly. Abdomen light yellowish. Legs white, banded beneath with dark fuscous, hairs of posterior tibiæ whitish-yellowish. Forewings elongate, moderate, costa moderately arched, apex round-pointed, termen hardly rounded, oblique; tawny-orange; markings shining snow-white, more or less edged with dark fuscous suffusion; a costal streak from near base to near apex, extremities attenuated; a slender subdorsal streak throughout, continued along termen to apex; a median longitudinal series of three rather large spots, first elongate, second oval, third subtriangular; beneath second a small additional spot; cilia fuscous-whitish, basal half orange mixed with dark fuscous. Hindwings fuscous, lighter anteriorly; cilia fuscous-whitish, basal half mixed with fuscous.

Duaringa, Queensland, in October and November (G. Barnard); five specimens.

Lower's type was from Bulimba.

Related generally to the *trijugella* group, but very distinct.

PYRGOPTILA, Meyr.

Pyrgoptila zelotis, n. sp.

Male, 20 mm. Head, palpi, antennæ, and thorax whitish-ochreous mixed with dark fuscous. Abdomen ochreous, segmental margins whitish-ochreous. Legs dark fuscous, ringed with whitish-ochreous, hairs of posterior tibiæ whitish-ochreous. Forewings elongate, costa anteriorly moderately, posteriorly gently arched, apex obtuse, ter-

men very obliquely rounded; fuscous, irregularly sprinkled with whitish and dark fuscous; a curved dark fuscous subbasal line; a cloudy dark fuscous transverse line at one-third, preceded by large ochreous-mixed tufts above and below middle, forming the posterior edge of a circular depression, which is pale surrounded with dark fuscous; two white dots consecutively placed in disc beyond middle, and an irregular white transverse bar from disc, beyond middle to dorsum; a large discal tuft of light ochreous scales beyond this; a strongly curved ochreous line from a white spot on costa at three-fourths to tornus, lower half spotted with white, preceded and followed by dark fuscous suffusion; cilia brownish, base sprinkled with dark fuscous. Hindwings fuscous, lighter basally; cilia light brownish.

Queensland, probably, but locality not recorded (A. Simson); one specimen.

The locality of the only other species of the genus, *P. serpentina*, Meyr., was accidentally omitted from the original description; I took it at Perth, West Australia, in November.

TORTRICOPSIS, Newm.

This generic name must be adopted in place of *Palparia*, Wing, the name *Palparia* was pre-occupied in the *Lepidoptera* by Haworth.

Tortricopsis pyroptis, n. sp.

Male and female, 19-22 mm. Head and thorax red-brown, more or less suffused with ashy-whitish. Palpi dark fuscous irrorated with whitish, lower two-thirds of second joint red-brown, tuft medorate, forming an equilateral triangle, terminal joint longer than second. Abdomen ochreous-yellow, beneath deeper ochreous and rosy-tinged. Forewings moderate, suboblong, costa strongly arched anteriorly, apex obtuse, termen sinuate, rather oblique; red-brown, mixed with grey, and anteriorly more or less suffused with grey-whitish; two short fine oblique blackish streaks from costa about one-fourth; two indistinct blackish-grey dots above middle of disc, appearing a continuation of the second streak; cilia red-brown, mixed with blackish-grey, extreme tips grey-whitish. Hindwings deep ochreous-yellow, towards apex tinged with brown-reddish and sprinkled with dark grey; cilia light brown-reddish mixed with dark grey except towards tornus.

Brisbane, Queensland; Melbourne and Healesville, Victoria; in January (J. A. Kershaw, A. J. Turner); seven specimens.

Nearest to *T. semijunctella*, but quite distinct. Mr. Kershaw has bred it from *Eucalyptus*.

TORTRICOPSIS CALLICHROA, n. sp.

Female, 22 mm. Head whitish-ochreous. Palpi with second joint ochreous-brown, becoming whitish-ochreous towards base, tip whitish, tuft short, triangular, terminal joint white, in front and towards apex grey. Thorax rosy-ochreous-grey, inner edge of patagia whitish. Abdomen grey. Forewings elongate, costa moderately arched, apex acute, subfalcate, termen concave, rather strongly oblique; brownish-ochreous, apical half suffused with rosy-pink; base of wing and of dorsum narrowly white, edged posteriorly with rosy-pink suffusion, an oblique ochreous-white streak from one-sixth of costa to below middle of succeeding fascia, edged anteriorly with a few blackish scales and posteriorly with rosy-pink suffusion; an irregular median fascia of white suffusion, forming a triangular blotch on costa, anterior edge running from one-third of costa to middle of disc, thence sharply angulated backwards and again forwards to beyond middle of dorsum, edged with some blackish scales, posterior edge very irregular and undefined; an elongate dark fuscous mark mixed with white in disc above middle; some dark fuscous suffusion above dorsal end of median fascia; a slender slightly sinuate white streak from three-fifths of costa to tornus, dilated on costa, edged anteriorly with blackish, preceded by dark grey suffusion; a short longitudinal white streak above apex; a dark fuscous suffusion along lower half of termen; cilia whitish-ochreous, pinkish-tinged, base whitish-suffused on lower half of termen. Hindwings grey; cilia whitish-grey.

Sheringa, South Australia, in October (E. Guest); one specimen.

May be placed next *T. falcifera*, but is widely distinct from it or anything else.

TORTRICOPSIS EUSARCA, n. sp.

Female, 14 mm. Head pale whitish-ochreous. Palpi whitish, tuft broad, very short, brush-like, rosy-tinged, terminal joint one-third. Thorax pale greyish-rosy. Abdomen grey Forewings elongate, moderate, costa gently arched, apex round-pointed, termen rather strongly oblique, rounded beneath; light rosy-pink, mixed with light-grey; a dark fuscous streak along basal third of dorsum; a longitudinal dark fuscous streak, edged above with whitish, in disc before and below middle, and another in disc above middle; a reddish-fuscous spot above tornus, preceded by some whitish suffusion; a whitish apical bar, margined above and beneath by reddish-fuscous spots; cilia whitish, base pinkish-tinged, with reddish-

fuscous basal spots above and below apex. Hindwings grey; cilia whitish-grey.

Quorn, South Australia, in October; one specimen.

The smallest and least conspicuous member of the genus, marked somewhat as *Eclecta aurorella*.

LEPIDOTARSA, Meyr.

Lepidotarsa argyropis, n. sp.

Male, 21 mm. Head and thorax light yellow, variegated with ferruginous. Palpi whitish-yellowish, second joint ferruginous towards apex. Abdomen ochreous-yellowish. Forewings elongate, moderate, costa gently arched, apex round-pointed, termen straight, oblique; light yellow, variegated throughout with ferruginous-red; a fuscous streak along dorsum throughout; a round silvery-white subdorsal spot before middle; a fuscous transverse streak from one-fourth of costa to dorsum before tornus, lower half considerably dilated posteriorly and enclosing a transverse-oval silvery-white spot; discal stigmata fuscous, plical silvery-white, directly beneath first discal, resting on preceding fascia; a small silvery-white spot towards apex; cilia fuscous, coppery-tinged, on costa coppery-reddish. Hindwings and cilia ochreous-yellowish, brassy-tinged, base of cilia towards tornus tinged with dark fuscous.

Sydney, New South Wales, in October (G. H. Raynor); one specimen.

Allied to *L. iriodes* and *L. chryserythra*, but abundantly distinct.

EUPHILTRA, Meyr.

Euphiltra chrysorrhoda, n. sp.

Female, 12 mm. Head and thorax tawny-orange. Palpi ochreous-orange irrorated with dark fuscous, terminal joint whitish. Antennæ dark fuscous. Abdomen whitish-ochreous, segmental margins ochreous-orange. Legs yellow-ochreous, anterior tibiæ suffused with crimson, anterior and middle tarsi banded with dark fuscous. Forewings elongate, costa moderately arched, apex round-pointed, somewhat produced, termen sinuate, very oblique; orange, becoming tawny towards margins: a fine white line from one-fourth of dorsum to middle of disc, edged beneath with tawny suffusion; an indistinct fine whitish inwards-curved transverse line at three-fifths, followed in disc by a straight black transverse mark attenuated downwards, and by a faint pink general suffusion; apex rather broadly suffused with rosy-pink; cilia orange-yellow, at apex with a black spot. Hindwings fuscous, anteriorly paler and

ochreous-tinged; cilia fuscous-whitish, suffused with light dull orange except round apex.

Sydney, New South Wales, in October (G. H. Raynor); one specimen.

This strikingly distinct and ornamental species is a true *Euphiltra*, but in color and markings shows a suggestive affinity to *Tortricopsis*.

HELIOCAUSTA, Meyr.

HELIOCAUSTA DORSIVITTELLA, Walk.

(*Psecadia dorsivittella*, Walk. Cat. Tin., 538.)

Male and female, 24-28 mm. Head ochreous-whitish, sides sharply dark brown. Palpi whitish, second joint light brownish externally above, with a dark fuscous streak on each side becoming obsolete downwards, terminal joint dark fuscous anteriorly towards apex. Antennæ light fuscous, ciliations in male (2). Thorax fuscous, with a broad central ochreous-whitish stripe, and dark fuscous stripe on each side of it. Abdomen pale yellowish. Legs yellow-whitish, anterior and middle pair banded with fuscous. Forewings elongate, moderate, costa rather strongly arched, apex round-pointed, produced, termen rather strongly concave, somewhat oblique; fuscous, irrorated with grey-whitish, dorsal area broadly darker fuscous, without irroration; extreme costal edge rosy-whitish; an ochreous-whitish dorsal streak from near base to tornus, narrowed to extremities, edged above with some dark ferruginous scales, and beyond middle with a triangular dark ferruginous spot edged with whitish; a very indistinct darker line from two-fifths of costa very obliquely outwards to five-sixths, thence obtusely angulated to tornus; cilia fuscous mixed with whitish, with dark ferruginous basal line mixed with dark fuscous. Hindwings light ochreous-yellow, apex and termen infuscated; cilia light yellowish, towards tips whitish, with a fuscous subbasal line.

Mount Macedon, Victoria (G. H. Raynor); Mount Lofty, South Australia (E. Guest); also from Tasmania; in December, three specimens.

This extremely distinct species does not harmonise well with *Heliocausta*, but I cannot discover any reliable point of generic separation; some affinity with *Tortricopsis* is suggested by the shape of wing, but the palpi do not support this. A weak and fugitive antennal pecten is present.

HOPLITICA, Meyr.

Hoplitica hepatitis, n. sp.

Female, 17 mm. Head and thorax pale ochreous, mixed with purplish-fuscous. Palpi whitish, terminal joint dark fuscous anteriorly. Antennæ ochreous-whitish, sharply annulated with blackish. (Abdomen broken.) Legs ochreous-whitish, anterior pair banded with dark fuscous. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen little rounded, oblique; whitish-ochreous, suffusedly irrorated with reddish-ochreous, and on dorsal half with purplish; base narrowly purplish; four moderately broad slightly oblique ill-defined dull crimson-purple fasciæ, first at one-fourth, angulated in middle, second before middle, rather curved, third at two-thirds, broader, slightly curved, fourth terminal, narrowed beneath, not reaching tornus; stigmata cloudy, dark fuscous, plical beneath first discal, both very indistinct, second discal larger, distinct, placed between second and third fasciæ, space above it forming a rather conspicuous light patch; cilia light ochreous-rosy, apical half ochreous-whitish, at apex and tornus grey. Hindwings grey, darker towards apex; cilia grey. Under surface of hindwings pale yellowish along costa.

Gisborne, Victoria, in December (G. Lyell); one specimen.

Allied to *H. rufa* and *H. absumptella*, but distinguished from all by the four purple fasciæ.

EULECHRIA, Meyr.

Eulechria phœnissa, n. sp.

Male, 16 mm. Head whitish-ochreous, yellowish-tinged. Palpi whitish-ochreous, lower half of second joint fuscous. Thorax rather dark coppery-fuscous, posteriorly narrowly whitish-ochreous. Abdomen whitish-ochreous, yellowish-tinged. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen little oblique, rounded beneath; uniform glossy whitish-ochreous; cilia whitish-ochreous. Hindwings light ochreous-grey; cilia whitish-ochreous.

Duaringa, Queensland, in April (G. Barnard); one specimen.

Nearest to *E. pantelella*, but easily known by the contrasted dark thorax.

Eulechria nicæa, n. sp.

Female, 26 mm. Head and thorax pale ochreous, slightly brown-sprinkled. Palpi ochreous-whitish, second joint dark fuscous except towards base and apex, terminal joint suffused with dark fuscous except towards base. Antennæ pale ochreous, ringed with dark fuscous. (Abdomen broken.)

Legs dark fuscous, ringed with whitish-ochreous (posterior pair broken). Forewings elongate, moderate, costa moderately arched, apex obtuse, termen rounded, rather oblique; ochreous-fuscous, obscurely irrorated with pale and dark; a small sharp triangular whitish-ochreous basal spot on dorsum, limited above by a small dark fuscous costal spot, and followed by darker suffusion; stigmata cloudy, dark fuscous, plical directly beneath first discal; a series of indistinct dark fuscous dots from three-fourths of costa to a prætornal spot, extremely close to costa and termen throughout; cilia light fuscous, darker-mixed, apical half fuscous-whitish. Hindwings whitish-fuscous; cilia fuscous-whitish, base mixed with fuscous.

Tasmania, probably, but locality not recorded (A. Simson); one specimen.

Allied to *E. ophthalmias*, but without the pale discal spots and dark head, and specially characterised by the large size.

EULECHRIA MESELECTRA, n. sp.

Male and female, 15-16 mm. Head and thorax pale ochreous, tinged with brown-reddish. Palpi whitish-ochreous, slightly reddish-tinged. Antennæ ochreous, base in male suffused with dark fuscous. Abdomen orange-ochreous, segmental margins pale brownish-ochreous. Legs rather dark fuscous, pale-ringed, posterior pair whitish-ochreous. Forewings elongate, costa moderately arched, apex obtuse, termen very obliquely rounded; brownish-ochreous, suffused with light purplish-fuscous, more strongly towards base; extreme base sharply whitish-ochreous, edged posteriorly with darker fuscous suffusion; second discal stigma obscurely darker; cilia brownish-ochreous, base mixed with fuscous, tips paler. Hindwings light grey or whitish-grey; cilia ochreous-grey-whitish.

Duaringa and Brisbane, Queensland, in September and October (G. Barnard, A. J. Turner); three specimens.

Similar in general appearance to the preceding species, but much smaller, and probably not really closely allied, as it differs much in palpi, form of wing, and other details.

EULECHRIA PIODES, n. sp.

Male and female, 13-17 mm. Head whitish-ochreous. Palpi rather stout, whitish-ochreous, second joint externally dark fuscous except at apex. Antennæ in male rather stout, ciliations (1½). Thorax whitish-ochreous, collar and shoulders coppery-fuscous. Abdomen golden-ochreous, segmental margins whitish-ochreous. Legs dark fuscous, ringed with whitish-ochreous, hairs of posterior tibiæ whitish-ochreous. Forewings elongate, moderate, costa gently arched, apex ob-

tuse, termen obliquely rounded; pale ochreous-yellowish, more or less tinged or partially suffused with brown; basal area wholly suffused with brown except a pale ochreous-yellowish spot along basal one-fourth of dorsum, followed by a dark fuscous dorsal suffusion; stigmata moderate, dark fuscous, plical directly beneath first discal; a triangular dark fuscous spot on middle of costa; an indistinct fuscous subterminal line starting from a darker costal spot at four-fifths, bent in middle, lower portion close to termen; cilia pale ochreous-yellowish, base more or less brownish. Hindwings whitish-ochreous, wholly suffused with light coppery-fuscous; cilia whitish-ochreous, tinged with fuscous.

Duaringa, Queensland, in November, February, April, and May (G. Barnard); seven specimens.

A peculiar species, not very near any other, characterised by the conspicuous dark costal spots.

EULECHRIA ZEMIODES, n. sp.

Female, 14 mm. Head, palpi, and thorax dark bronzy-fuscous, pale-sprinkled. Antennæ, abdomen, and legs rather dark fuscous, legs whitish-ringed. Forewings elongate, costa moderately arched, apex round-pointed, termen very obliquely rounded; rather dark bronzy-fuscous, mixed with lighter and darker; stigmata large, blackish-brown, plical directly beneath and suffusedly confluent with first discal; some pale scales in middle of disc, and a pale suffusion beyond second discal; posterior half of costa broadly suffused with blackish-brown, except on a whitish-ochreous costal spot at two-thirds; some pale scales towards apex; cilia bronzy-fuscous, somewhat mixed with paler and darker. Hindwings and cilia rather dark fuscous.

Bendigo, Victoria, in November (G. Lyell); one specimen.

Not close to any other; perhaps most allied to the New Zealand *E. zophoessa*.

EULECHRIA HYMENÆA, n. sp.

Male, 15-16 mm. Head yellow. Palpi pale yellow, lower half of second joint dark fuscous. Thorax dark fuscous. Abdomen grey. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen obliquely rounded; yellow; base narrowly dark fuscous; a moderate inwards-curved dark fuscous fascia from three-fourths of costa to tornus; cilia pale yellowish, posteriorly brownish-tinged, on extremities of fascia suffused with dark fuscous. Hindwings and cilia grey.

Duaringa and Warwick, Queensland, in September (G. Barnard, A. J. Turner); two specimens.

Belongs to the group of *E. malacoptera*; it cannot be confused with any species of the genus, but is extremely similar to some species of *Cœsyra*.

EULECHRIA ISCHNODES, n. sp.

Male, 26 mm. Head grey-whitish, crown with a fuscous spot. Palpi whitish, second joint dark grey except apex. Antennæ grey, ciliations (1½). Thorax whitish, mixed with fuscous. Abdomen light greyish-ochreous. Legs grey, posterior pair white. Forewings elongate, costa moderately arched, apex round-pointed, termen very obliquely rounded; fuscous, irrorated with whitish, in disc and posteriorly largely suffused with white, which forms a sub-costal streak well defined on costal side from near base to three-fourths; stigmata small, dark fuscous, plical somewhat obliquely beyond first discal, a similar dot between and rather above first and second discal, and another beneath and rather obliquely before second discal; an interrupted curved subterminal line of ground color from four-fifths of costa to before tornus, sharply indented and darkened beneath costa, its indentation connected with lower extremity by a transverse undefined suffusion of ground color, a terminal series of indistinct darker fuscous dots; cilia whitish, with two indistinct pale fuscous shades. Hindwings pale fuscous; cilia ochreous-whitish, with two faint pale fuscous shades.

Kewell, Victoria (J. A. Kershaw); one specimen.

Belongs to the *adoxella* group, in which it is readily recognised by its considerable size, relatively narrow wings, and general white suffusion, with distinct subcostal streak.

EULECHRIA PHORYNTIS, n. sp.

Female, 21 mm. Head and thorax grey, whitish-mixed. Palpi dark grey, apex of second joint white. Antennæ grey, pale-ringed. Abdomen grey, ovipositor long. Legs dark grey, whitish-ringed, hairs of posterior tibiæ whitish. Forewings elongate, moderate, costa rather strongly arched on anterior half, gently posteriorly, apex round-pointed, termen very obliquely rounded; grey, irregularly irrorated with whitish and dark fuscous; veins partially obscurely streaked with darker; an oblique irregular cloudy dark subbasal fascia indistinctly indicated, stigmata dark fuscous, ill-defined, plical obliquely beyond first discal; a sharply angulated series of suffused dark fuscous dots from three-fourths of costa to tornus, upper section sinuate inwards; cilia pale fuscous, somewhat mixed with whitish and dark fuscous. Hindwings grey, paler anteriorly; cilia pale whitish-fuscous, with traces of two cloudy darker shades.

Gisborne, Victoria, in April (G. Lyell); one specimen.

An obscure insect, apparently nearest to *E. ærodes*, but distinguishable by the somewhat different form of wing, subbasal fascia, and the absence of the characteristic fine ochreous-white costal edge.

Eulechria scotiodes, n. sp.

Male, 16-17 mm. Head and thorax dark fuscous mixed with whitish-ochreous. Palpi dark fuscous, second joint with whitish apical and subapical rings. Antennæ fuscous, ciliations (1). Abdomen fuscous, segmental margins ochreous-whitish. Legs dark fuscous ringed with ochreous-whitish, hairs of posterior tibiæ ochreous-whitish. Forewings elongate, rather narrow, costa moderately arched, apex round-pointed, termen very obliquely rounded; dark fuscous, irregularly mottled with ochreous-whitish; stigmata rather large, darker fuscous, ill-defined, plical obliquely before first discal, an additional spot beyond first discal, and one on costa above second discal; cilia whitish-fuscous, partially mixed with dark fuscous. Hindwings grey-whitish; cilia whitish ochreous, round apex fuscous-tinged.

Adelaide, South Australia, in September (O. Lower); three specimens.

This species is easily recognised by the peculiar ochreous-whitish mottling of the narrow forewings, and the grey-whitish hindwings; perhaps most allied to *E. adelphodes*, Low.

Eulechria optalea, n. sp.

Female, 14 mm. Head, palpi, and thorax pale yellow-ochreous, sprinkled with brown or dark fuscous. Antennæ whitish-ochreous, annulated with dark fuscous. Abdomen whitish-ochreous, ovipositor very long. Legs dark fuscous, ringed with whitish-ochreous, hairs of posterior tibiæ whitish-ochreous. Forewings elongate, narrow, costa gently arched, apex round-pointed, termen extremely obliquely rounded; light yellow-ochreous, sprinkled with dark fuscous; dark fuscous dots on base of costa and dorsum; stigmata moderate, dark fuscous, plical directly beneath first discal; a very strongly curved series of undefined dark fuscous dots from three-fifths of costa to tornus, running very close to costa and termen; cilia pale yellow-ochreous, sprinkled with dark fuscous, tips ochreous-whitish. Hindwings tolerably pointed, grey, becoming whitish-grey anteriorly; cilia ochreous-whitish.

Gisborne, Victoria, in January (G. Lyell); one specimen.

By the narrow wings allied to *E. charierga* and *stenota*, but easily known by yellow-ochreous ground color and absence of black median costal spot.

ŒNOCHROA, Meyr.

ŒNOCHROA HOMORA, n. sp.

Female, 16 mm. Head, palpi, and thorax dark bronzy-fuscous, finely sprinkled with white. Antennæ dark fuscous. Abdomen dark grey, apex ochreous-yellow beneath. Legs dark fuscous, posterior tarsi ringed with whitish, hairs of posterior tibiæ whitish. Forewings elongate, narrow, costa moderately arched, apex round-pointed, termen extremely obliquely rounded; dark fuscous, slightly bronzy-tinged, irrorated with grey whitish-edged scales; the pale irroration forms an undefined longitudinal streak in disc from one-fourth to three-fourths, edged above and below with darker streaks from absence of irroration; cilia fuscous, somewhat whitish-sprinkled. Hindwings fuscous, darker posteriorly; cilia fuscous.

Hobart, Tasmania, in December; one specimen. Also found at Brisbane, Queensland, by Dr. A. J. Turner, who has bred the species from *Acacia*.

Distinguished from the rest of the genus by the combination of small size and dark hindwings.

LINOSTICHA, Meyr.

LINOSTICHA AUTOGRAPHA, n. sp.

Male, 19 mm. Head whitish, crown fuscous except on sides. Palpi fuscous, apex of second joint whitish, terminal joint whitish, basal half suffused with dark fuscous above. Thorax rather dark fuscous. Abdomen pale grey. Forewings elongate, costa gently arched, apex obtuse, termen very obliquely rounded; fuscous, somewhat mixed with dark fuscous, between veins marked with cloudy dark fuscous lines; costal edge white; veins partially streaked with white, especially margins of cell, towards base of upper margin stronger and more sharply marked; stigmata obscured, dark fuscous, plical beneath first discal; cilia pale grey, base mixed with fuscous. Hindwings and cilia pale grey.

Sydney, New South Wales, in April; one specimen.

Not near any other; perhaps most related to *L. dichroa*, Low.

LINOSTICHA THEMERODES, n. sp.

Male, 20 mm. Head whitish-ochreous, sprinkled with dark fuscous. Palpi ochreous-whitish, irrorated with dark fuscous.

Antennæ dark grey. Thorax whitish-ochreous, irrorated with dark fuscous. Abdomen pale ochreous, segmental margins ochreous-grey-whitish. Legs dark fuscous ringed with ochreous-whitish, posterior pair whitish-ochreous. Forewings elongate, moderate, costa gently arched, apex rounded, termen very obliquely rounded; pale whitish-ochreous, bronzy-shining, irregularly irrorated with bronzy-fuscous; base narrowly suffused with dark bronzy-fuscous; stigmata rather large, cloudy, dark fuscous, discal approximated, plical obliquely before first discal, a similar additional dot directly above plical; a curved series of cloudy dark fuscous dots from four-fifths of costa to a cloudy praetornal spot, upper half confluent with a cloudy transverse costal blotch; cilia pale whitish-ochreous, basal half mixed with fuscous. Hindwings pale fuscous; cilia fuscous-whitish.

Gisborne, Victoria, in October (G. Lyell); one specimen.

Apparently most allied to *L. nomistis*, but very distinct.

TRACHYNTIS, Meyr.

Trachyntis thrypticopa, n. sp.

Male, 13 mm. Head white. Palpi white, lower three-fifths of second joint and subbasal and apical rings of terminal joint blackish. Antennæ blackish. Thorax white, partially ochreous-tinged. Abdomen grey. Legs dark fuscous, whitish-ringed, hairs of posterior tibiæ fuscous-whitish. Forewings elongate, narrow, costa moderately arched, apex round-pointed, termen extremely obliquely rounded; pale yellow-ochreous, with a few scattered blackish scales; basal area white, except a subcostal spot of groundcolor, and black spots at base of costa and dorsum; a white costal streak, interrupted at one-fourth and one-half by bronzy-fuscous patches irrorated with black, terminated posteriorly by apical patch; stigmata dark fuscous, first discal moderate, plical forming an oval spot obliquely before first discal, second discal large, connected with an irregular spot beneath and obliquely before it, and followed by a white suffusion; a large apical bronzy-fuscous patch irrorated with blackish, narrowly extended along termen to tornus, containing some whitish scales near apex; cilia light bronzy-fuscous, base sprinkled with blackish. Hindwings grey; cilia light grey.

Gisborne, Victoria, in November (G. Lyell); one specimen.

Extremely distinct; may be placed next *T. xenopis*.

TRACHYNTIS EPIPONA, n. sp.

Male, 13 mm. Head grey-whitish. Palpi whitish, lower half of second joint dark fuscous. Antennæ grey. Thorax grey-whitish, mixed anteriorly with fuscous. Abdomen grey. Legs dark fuscous, ringed with whitish, hairs of posterior tibiæ whitish. Forewings elongate, rather narrow, costa gently arched, apex rounded, termen very obliquely rounded; grey-whitish, irregularly sprinkled with fuscous and a few black scales; four direct irregular dark brown fasciæ, first subbasal, second before middle, including cloudy blackish plical and first discal stigmata, third at two-thirds, including cloudy black second discal stigma, fourth subapical, suffusedly confluent with third in middle; cilia whitish, mixed with fuscous and dark fuscous. Hindwings grey, darker terminally; cilia light grey.

Sydney, New South Wales, in April; one specimen. Allied to *T. delophanes*, but narrower-winged, without the white discal streak, and otherwise quite distinct.

PHLŒOPOLA, Meyr.

PHLŒOPOLA EPETHISTIS, n. sp.

Male and female, 20-24 mm. Head ochreous-whitish, mixed with fuscous. Palpi ochreous-whitish, basal half and a subapical ring of second joint, and a broad band above base of terminal joint dark fuscous. Antennæ pale ochreous, obscurely spotted with dark fuscous. Thorax rather dark fuscous, sprinkled or mixed with ochreous-whitish. Abdomen brownish-ochreous, segmental margins ochreous-whitish. Legs dark fuscous, ringed with ochreous-whitish, hairs of posterior tibiæ ochreous-whitish. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen little rounded, oblique; pale whitish-ochreous, confusedly mixed and irrorated with brownish-ochreous and dark fuscous; a bronzy-brown basal patch mixed with dark fuscous; a very undefined bronzy-brown fascia from one-fourth of costa to middle of dorsum, and another from middle of costa to tornus, sharply angulated below middle; stigmata cloudy, dark fuscous, plical more or less elongate, obliquely before first discal; a curved subterminal series of coudy dark fuscous dots, starting from an inwardly oblique dark fuscous spot on costa towards apex; cilia pale whitish-ochreous mixed with fuscous and dark fuscous. Hindwings ochreous-grey-whitish, somewhat fuscous-sprinkled; cilia fuscous-whitish mixed with fuscous.

Deloraine, Tasmania, in December; three specimens.

A confusedly-marked species, belonging to the *turbatella* group, but distinguished from all near allies by the pale hindwings.

SPHYRELATA, Meyr.

Sphyrelata melanoleuca, Meyr.

Gelechia microspiloplaca, Low., Trans. Roy. Soc., S. Austr., 1894, 106, is a synonym of this.

ACOLASTA, n. g.

Head smooth-scaled; tongue developed. Antennæ three-fourths, in male serrulate, shortly ciliated (½), basal joint moderate, with slight pecten. Labial palpi very long, recurved, second joint thickened with appressed scales, terminal joint as long as or shorter than second, slender, acute. Posterior tibiæ clothed with long fine hairs above. Forewings: 2 from very near angle, 7 and 8 stalked, 7 to apex, 11 from middle of cell. Hindwings (1), elongate-ovate, cilia two-thirds, 3 and 4 connate.

This and the six following genera form an associated group (to which also the large European genus *Depressaria* and its allies belong), which may be regarded as a development of the *Borkhausenia* group. The antennæ are simple or very shortly ciliated in the male, and vein 7 of the forewings terminates in the costa or apex.

Type *A. scolia*.

Acolasta pachnias, n. sp.

Female, 18 mm. Head and thorax white, finely irrorated with dark fuscous. Palpi white, second joint dark fuscous on basal half and a subapical ring. Abdomen grey. Forewings elongate, rather narrow; costa moderately arched, apex round-pointed, termen very obliquely rounded; white, finely irrorated with fuscous and dark fuscous, with fine blackish streaks between veins; stigmata small, blackish, plical rather beyond first discal; cilia whitish, sprinkled and barred with dark fuscous. Hindwings rather dark grey, lighter towards base; cilia grey-whitish, suffused with fuscous towards base.

Duaringa, Queensland, in October (G. Barnard); one specimen. Characterised by the distinct black stigmata, and darker hindwings.

Acolasta scolia, n. sp.

Male and female, 18-20 mm. Head whitish, crown dark fuscous except on sides. Palpi white, second joint dark fuscous above. Thorax white, with blackish dorsal and præ-

lateral stripes. Abdomen pale ochreous-grey. Forewings elongate, rather narrow, costa moderately arched, apex round-pointed, termen very obliquely rounded; whitish, irregularly streaked with dark fuscous between veins; a thicker subcostal streak from base of costa to beneath middle of costa, an irregular-edged median longitudinal streak from base to apex, and a broader dorsal streak from near base to tornus; cilia fuscous, mixed with dark fuscous, base mixed with white. Hindwings and cilia light ochreous-grey.

Sydney, New South Wales, in November and December; three specimens.

The strong dorsal streak distinguishes it equally from the preceding insect, and from the very similar species of the following genus. All these frequent the trunks of stringy-barked *Eucalypti*, and are colored for concealment in that situation.

LEPTOSACES, Meyr.

Head smooth-scaled; tongue developed. Antennæ three-fourths, serrulate, in male simple, basal joint moderate, without pecten. Labial palpi very long, recurved, second joint thickened with scales, more or less rough towards apex above and beneath, terminal joint shorter than second, slender, acute. Posterior tibiæ clothed with long fine hairs above. Forewings: 7 and 8 stalked, 7 to costa, 11 from midde of cell. Hindwings (1), elongate-ovate, cilia two-thirds; 3 and 4 connate.

Based on a New Zealand species, from which the Australian forms only appear to differ in the more roughly scaled palpi, and as even in them the rough scaling seems to be sometimes naturally appressed, there is no sufficient cause for discrimination.

Leptosaces schistopa, n. sp.

Male and female, 13-18 mm. Head fuscous-whitish mixed with fuscous, crown darker centrally. Palpi fuscous-whitish mixed with dark fuscous. Thorax light fuscous, whitish-sprinkled, with blackish dorsal and lateral stripes. Abdomen light fuscous. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very obliquely rounded; whitish, somewhat mixed with fuscous, coarsely and irregularly streaked with blackish-fuscous between veins; a blackish-fuscous median longitudinal streak from base to termen, finely attenuated basally; a stronger blackish-fuscous subdorsal streak from base to tornus; cilia dark fuscous,

sprinkled with whitish. Hindwings fuscous, lighter anteriorly; cilia pale fuscous.

Brisbane, Queensland; Glen Innes (3,500 ft.), New South Wales; Gisborne, Victoria; from October to December, six specimens.

Very similar to the following, but smaller, and easily distinguished by the dark hindwings.

LEPTOSACES PYTINÆA, n. sp.

Female, 18-19 mm. Head whitish, crown suffused with dark fuscous except on sides. Palpi whitish, second joint dark fuscous on basal two-thirds and a subapical ring, terminal joint mixed with dark fuscous Thorax whitish, with blackish dorsal and lateral stripes. Abdomen ochreous-grey-whitish. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very fuscous between veins; a thicker subcostal streak from base to beneath middle of costa, and one in disc from one-fifth to two-thirds; a stronger blackish-fuscous subdorsal streak from base to tornus; cilia whitish, sprinkled with dark fuscous. Hindwings and cilia ochreous-grey-whitish.

Sydney, New South Wales, in October; four specimens.

Characterised by the whitish hindwings.

PHÆOSACES, Meyr.

This genus would be inserted here; it contains several New Zealand species, and I have also described one from Ceylon; it is, therefore, probable that the genus will be found to occur in Queensland, but at present I have seen no Australian species referable to it.

PEDOIS, Turn.

Hairs of crown forming a strong projecting tuft between antennæ; tongue developed. Antennæ three-fourths, in male serrulate, very shortly ciliated ($\frac{1}{2}$), second joint thickened with appressed scales and with rough projecting scales above towards apex, terminal joint shorter, slender, acute. Posterior tibiæ clothed above with long hairs. Forewings: 2 from near angle of cell, 7 and 8 stalked, 7 to costa, 11 from middle of cell. Hindwings (1), elongate-ovate, cilia one-third, 3 and 4 connate or short-stalked.

I now restrict this genus (originally communicated by me to Dr. Turner in a wider sense, and so described by him) to the following single species only; he has specified no type, and his

description clearly includes this and the following genus. The curious frontal tuft (caused by the side tufts being prolonged forwards) and the projecting scales of the palpi are sufficient distinction.

PEDOIS NEUROSTICHA, Low.

(*Pedois neurosticha*, Low., Trans. Roy. Soc., S. Austr., 1894, 112.)

Male and female, 21-24 mm. Head and thorax whitish, irrorated with grey. Palpi whitish, second joint grey in front, and with grey subapical and sometimes supramedian rings, terminal joint dark grey in front. Abdomen pale greyish-ochreous. Forewings moderate, suboblong, costa anteriorly strongly arched, apex rounded, termen rather obliquely rounded; white, irrorated with grey; numerous short irregular undefined dark grey longitudinal streaks, roughly arranged in three angulated series parallel to costa and termen, and a similar series along posterior half of costa and termen; stigmata blackish, rather undefined, plical slightly beyond first discal; cilia whitish. Hindwings light grey; cilia whitish-grey, tips whitish.

Blackheath (3,500 ft.), Glen Innes (3,500 ft.), and Cooma (3,000 ft.), New South Wales; Gisborne, Victoria; Mount Lofty, South Australia; ten specimens.

Frequents the trunks of *Eucalyptus*.

DOLEROMIMA, n. g.

Head with appressed scales; tongue developed. Antennæ three-fourths, in male serrulate, very shortly ciliated (½), basal joint moderate, without pecten. Labial palpi long, recurved, second joint thickened with appressed scales, terminal joint shorter, slender, acute. Posterior tibiæ clothed above with long hairs. Forewings: 2 from near angle, 7 and 8 stalked, 7 to costa, 11 from middle of cell. Hindwings (1), elongate-ovate, cilia one-third; 3 and 4 connate or short-stalked.

Allied to *Phæosaces*, from which it differs by the costal termination of vein 7 of forewings, and shortly ciliated antennæ of male.

Type *D. eumorpha*. To this genus belongs also probably *D. rhodomita*, Turn., which I do not possess.

DOLEROMIMA HUMERANA, Walk.

(*Conchylis humerana*, Walk., Cat. Tort., 366.)

Male and female, 17-21 mm. Head orange. Palpi whitish-ochreous, second joint blackish except towards base and apex,

terminal joint blackish anteriorly. Thorax orange, on sides and posteriorly blackish. Abdomen ochreous-yellowish. Forewings moderately broad, suboblong, costa anteriorly strongly arched, apex rounded, termen rather obliquely rounded; ochreous-orange; a blackish streak along basal third of costa, sometimes suffused posteriorly; an irregular straight slightly oblique blackish streak from costa beyond middle, not reaching dorsum; cilia pale orange. Hindwings rather dark grey, dorsally tinged with ochreous-whitish; cilia ochreous-whitish.

Armidale (3,500 ft.), Tenterfield (3,000 ft.), and Blackheath (3,500 ft.), New South Wales; Melbourne, Victoria; Launceston, Tasmania; from December to February, six specimens.

Larva probably feeds on *Eucalyptus*. Pupa stout, head and shoulders angulated, emitting short blunt processes; fuscous-grey, marbled with whitish, with a pale lateral stripe; naked and exposed, sitting erect on the truncate anal segment. I once found a larva, which changed immediately to the extremely singular pupa described above, and bred the imago from it. The species is conspicuously distinct.

Doleromima eumorpha, n. sp.

Male and female, 18-22 mm. Head and thorax reddish-fuscous. Palpi whitish, second joint with three irregular black bands, terminal joint black anteriorly. Abdomen dark fuscous. Forewings moderate, suboblong, costa anteriorly strongly arched, apex very obtuse, termen rather obliquely rounded; reddish-fuscous; costal edge yellowish-white; stigmata black, plical beneath first discal, second discal somewhat larger, followed by a patch of rather paler suffusion in disc; a very indistinct somewhat darker angulated subterminal fascia; cilia light reddish-fuscous, basal half barred with darker. Hindwings deep ochreous-yellow; a patch along dorsum, small apical patch, and terminal line dark fuscous; cilia dark fuscous.

Armidale (3,500 ft.) and Bathurst (2,500 ft.), New South Wales; Melbourne, Victoria; in October and November, ten specimens.

Very distinct by the yellow hindwings.

Doleromima tripunctella, Walk.

(*Cryptolechia tripunctella*, Walk. Cat. Tin., 757; *Pedois cosmopoda*, Turn., Trans. Roy. Soc., S. Aust., 1900, 12.)

Male and female, 16-19 mm. Head and thorax reddish-brown mixed with grey-whitish. Palpi whitish, second joint

with three dark fuscous bands, terminal joint dark fuscous anteriorly. Abdomen pale whitish-ochreous. Forewings moderate, suboblong, costa anteriorly strongly arched, apex obtuse, termen obliquely rounded; light fuscous, mixed with reddish, marked with irregular suffused dark fuscous streaks on veins, anterior half irregularly suffused with grey-whitish; extreme costal edge rosy-white; stigmata dark fuscous, sometimes ill-defined, plical beneath first discal, sometimes extended anteriorly to form a short dash, second discal somewhat larger; a thick cloudy dentate angulated grey-whitish line, near and parallel to posterior half of costa and termen; cilia rosy-whitish, basal half barred with fuscous. Hindwings light grey, ochreous-tinged, paler towards base; cilia grey-whitish or light grey.

Brisbane, Queensland; Sydney, New South Wales; from August to October, ten specimens.

I am unable to regard *cosmopoda*, Turn. (of which I have an example received from Dr. Turner) as anything but a variety; the species varies a good deal in development of color and distinctness of marking.

Doleromima ceramora, n. sp.

Male, 18-23 mm. Head and thorax fuscous, somewhat mixed with grey-whitish. Palpi whitish, second joint with three blackish bands, terminal joint blackish anteriorly. Antennæ fuscous. Abdomen pale greyish-ochreous. Legs ochreous-whitish, anterior and middle pair banded with dark fuscous. Forewings elongate, moderate, costa anteriorly moderately, posteriorly gently arched, apex obtuse, termen little rounded, rather strongly oblique; fuscous, sometimes reddish-tinged, sprinkled with dark fuscous; anterior half more or less mixed with ochreous-whitish; stigmata indistinct, dark fuscous, plical beneath first discal; a thick cloudy dentate angulated ochreous-whitish subterminal line, near and parallel to posterior half of costa and termen; a terminal series of dark spots; cilia pinkish-whitish, with interrupted fuscous median bar. Hindwings light grey, paler towards base; cilia pale grey.

Gisborne, Victoria, in September (G. Lyell); two specimens.

Nearly allied to the preceding, but certainly distinct by the different form of the forewings, which are more elongate, distinctly narrowed anteriorly, with the costa less arched and termen more oblique; it is also a larger insect, without any defined dark streaks on veins.

OCTASPHALES, Meyr.

Head with appressed hairs; tongue developed. Antennæ 1 or over 1, in male simple, basal joint moderate, without pecten. Labial palpi very long, recurved, smooth-scaled, terminal joint as long as or shorter than second, acute. Posterior tibiæ clothed with long hairs above. Forewings: 2 from near angle, sometimes stalked with 3, 7 to apex, 8 absent (coincident with 7), 11 from middle of cell. Hindwings 1, oblong-ovate, cilia one-hird; 3 and 4 connate, 7 curved downwards in middle.

Founded on a New Guinea species, *O. charitopa*, with which the following is congeneric. Immediately distinguished from all near allies by the coincidence of veins 7 and 8 of the forewings; in all other respects, however, it is cosely related to *Peritorneuta*, and if any species should prove to be variable in this particular the two genera would have to be united, in which case *Octasphales* has priority.

Octasphales chorderes, n. sp.

Male and female, 15-16 mm. Head, palpi, and thorax brown. Abdomen light ochreous-yellow. Forewings moderately broad, oblong, costa rather strongly arched, apex rounded, termen hardly oblique, rounded; light brown, sometimes rosy-tinged, sometimes mixed with pale ashy-grey in disc; costal edge pale yellow-ochreous, sometimes rosy-suffused; numerous indistinct scattered dark brown dots; a straight transverse ill-defined dark brown streak from middle of costa to four-fifths of dorsum; cilia ochreous-grey-whitish, with an indistinct fuscous line, base slightly rosy-tinged. Hindwings rather dark grey; costal edge and a suffusion along dorsum pale yellowish; cilia ochreous-whitish, with a faint grey line.

Rosewood, Queensland, in September; two specimens.

PERITORNEUTA, Turn.

Head with appressed hairs; tongue developed. Antennæ 1 or over 1, in male simple, basal joint moderate, without pecten. Labial palpi very long, recurved, smooth-scaled, terminal joint shorter than second, acute. Posterior tibiæ clothed with long hairs above. Forewings: 2 from near angle, 7 and 8 stalked, 7 to apex, 11 from middle of cell. Hindwings 1, oblong-ovate, cilia one-third; 3 and 4 connate, 7 curved downwards in middle.

Dr. Turner adopted this genus from me, but has given the

characters incorrectly, 6 and 7 of forewings being stated as stalked, instead of 7 and 8. He has not specified a type; I make *P. circulatella* the type. The length of the antennæ distinguishes it from all its near allies in Australia except the preceding and *Cerycostola;* the peculiar rounded appearance of the wings is also characteristic. *P. stigmatias*, Turn., is unknown to me, but is doubtless correctly referable to the genus.

PERITORNEUTA CIRCULATELLA, Walk.

(*Cryptolechia circulatella*, Walk. Cat. Tin., 767.)

Male and female, 19-21 mm. Head and thorax whitish-rosy-grey. Palpi rosy-grey, more whitish basally, terminal joint with two dark bands. Abdomen light ochreous-yellowish. Forewings moderately broad, costa strongly rounded, apex rounded, termen vertical, rounded beneath; light reddish-ochreous, sometimes rosy-tinged, with numerous transverse dark ferruginous-brown strigæ more or less broken up into series of dots; costal edge pale rosy; a broad streak of grey-whitish suffusion along anterior half of costa, posteriorly irregularly extended into disc; an indistinct grey-whitish suffusion on costa beyond middle; a narrow grey-whitish terminal streak; cilia grey-whitish, rosy-tinged. Hindwings ochreous-yellow, towards apex darker and sometimes rosy-tinged; cilia light ochreous-yellowish, base sometimes fuscous-tinged.

Maryborough and Brisbane, Queensland, in October; three specimens.

Differs from all the rest by the pale costal patch and clear yellow hindwings.

PERITORNEUTA THYELLIA, n. sp.

Male and female, 16-18 mm. Head, palpi, and thorax pale flesh-color. Abdomen ochreous-grey-whitish. Forewings moderate, costa rather strongly arched, apex rounded, termen hardly oblique, rounded beneath, pale flesh-color; numerous more or less distinct dark fuscous dots, arranged in irregular transverse series; an indistinct prætornal spot of grey suffusion; cilia ochreous-whitish, pinkish-tinged. Hindwings whitish-ochreous or pale yellowish, generally more or less fuscous-tinged; cilia ochreous-whitish.

Duaringa, Rockhampton, Rosewood, and Brisbane, Queensland; Newcastle, New South Wales; in September, eight specimens.

PERITORNEUTA RHODOPHANES, n. sp.

Male and female, 16-18 mm. Head, palpi, and thorax pale grey, sometimes rosy-tinged. Abdomen grey-whitish. Fore-

wings moderate, costa rather strongly arched, apex rounded, termen hardly oblique, rounded beneath; pale grey, sometimes suffused with pale pinkish; costal edge light rosy; numerous dark grey dots, sometimes mostly obsolete, arranged in irregular transverse series; a larger transverse dark fuscous dot in disc beyond middle; cilia grey-whitish, more or less pinkish-tinged. Hindwings light grey or whitish-grey; cilia grey-whitish.

Geraldton, York, and Perth, West Australa, in November; eleven specimens.

Allied to the preceding, but distinguished by the hindwings not being yellowish, and the absence of the darker prætornal cloud.

CERYCOSTOLA, n. g.

Head with loosely appressed scales; tongue developed. Antennæ (1), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, much exceeding base of antennæ, terminal joint considerably shorter than second, acute, rather thickened with scales, with a median tooth of projecting scales posteriorly. Posterior tibiæ loosely haired. Forewings: 2 from near angle, 7 and 8 stalked, 7 to apex, 11 from before middle of cell. Hindwings (1), ovate, cilia one-sixth; 3 and 4 connate, 7 bent downwards in middle.

I am now of opinion that my reference of the following species to *Gonionota*, Zell., was not justified; Zeller's definition of his genus is extremely imperfect (the neuration not being described at all); the only tangible distinctive character given, the median posterior scale-tuft on terminal joint of labial palpi, since it occurs also in the allied *Binsitta* and *Semiocosma*, may belong to more than one other genus. Hence I give it a new generic name; the structural characters as above were not published with the species, but I described them at the time from the original types.

The genus is clearly allied to *Peritorneuta*.

CERYCOSTOLA PYROBOLA, Meyr.

(*Gonionota pyrobola*, Meyr., Proc. Linn. Soc., New South Wales, 1886, 1041.)

I have seen no specimens except the original types.

BINSITTA, Walk.

Head with appressed hairs; tongue short. Antennæ ($\frac{1}{2}$), in male simple, basal joint elongate, without pecten. Labial palpi very long, recurved, second joint much thickened beneath

with dense brush of rough projecting scales, terminal joint as long as second, slender, acute, towards middle thickened in front and behind with projections of rough scales. Thorax with erect crest of scales. Posterior tibiæ with dense long hairs above, all tarsi short and stout. Forewings with tufts of raised scales, middle third of costa excavated; 2 from rather near angle, 4 and 5 connate, 7 and 8 stalked, 11 from middle of cell. Hindwings (1), trapezoidal, cilia one-third; 3 and 4 short-stalked.

A small Indo-Malayan genus of peculiar facies, belonging to the *Depressaria* group.

BINSITTA EFFRACTELLA, Snell.

(*Cryptolechia effractella*, Snell, Tijd., v., Ent., xxii., ii., pl. vii., 17-25; *Teratomorpha cœliota*, Turn., Trans. Roy. Soc., S. Austr., 1896, 20.)

Male, 28 mm. Head pale whitish-ochreous. Palpi whitish, terminal joint with two blackish rings. Forewings oblong, costa roughened with scale-tufts at one-third and two-thirds, termen little oblique, hardly sinuate; pale whitish-ochreous; a trapezoidal dark fuscous blotch, with leaden-metallic reflections, on costa at one-fifth; two large discal tufts below this, and two others transversely placed before middle, partially brownish-tinged, separated by some dark fuscous scales; some raised spots with silvery-whitish reflection beyond this; some brown and black scales towards costa beyond middle; two posterior angulated series of raised spots with silvery-whitish reflections, accompanied by a few black scales, last almost terminal and transversing a triangular brown apical blotch mixed with black; cilia brownish, with leaden-metallic reflections. Hindwings pale ochreous-yellow; a blackish apical dot; cilia whitish-yellowish, at apex wih two blackish lines.

Bowen, Queensland; one specimen received from A. Simson, and others in the Brisbane Museum.

CERATOPHYSETIS, Meyr.

A development of *Psecadia*, characterised by the peculiar antennæ. Dr. Turner mentions that in a better-preserved example the anterior edge of the antennæ is furnished with a brush of long whitish hairs.

CERATOPHYSETIS SPHÆROSTICHA, Meyr.

(*Ceratophysetis sphærosticha*, Meyr., Proc. Linn. Soc., New South Wales, 1886, 1045.)

I possess a female from Queensland; in this sex the antennæ are normal, but otherwise there is no particular difference.

PSECADIA, Hb.

Head with appressed scales; tongue developed. Antennæ three-fourths, in male shortly ciliated, basal joint without pecten. Labial palpi moderate or long, recurved, second joint with appressed scales, terminal joint shorter, acute. Posterior tibiæ clothed with hairs. Forewings: 2 from near angle, 7 and 8 stalked, 7 to costa or apex. Hindwings (1), elongate-ovate, cilia one-third; 3 and 4 connate.

A small genus of very wide distribution. The species are usually retired in habit, and not to be taken freely in the perfect state.

Psecadia postica, Zell.

(*Psecadia postica*, Zell., Hor. Ross, 1877, 236, pl. iii. 72.)

Female, 21-22 mm. Head white. Palpi white, lower half of second joint and base of terminal joint blackish. Antennæ black. Thorax white, base of patagia, a central blotch, and posterior spot blackish. Abdomen dark fuscous, segmental margins white, anal tuft black. Legs dark fuscous, banded with white. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen nearly straight, rather oblique; white, with blackish-fuscous markings; costal edge blackish, interrupted about one-fourth and near apex; an irregular costal spot near base; a dorsal dot at one-fourth; an irregular costal spot near base; a dorsal dot at one-fourth; an irregular bar from one-fifth of costa, reaching three-fourths across wing; a small subdorsal spot before middle; a small triangular spot on costa at two-fifths, and a dot below it; a small triangular spot on costa beyond middle; a transverse S-shaped mark beyond middle towards dorsum, but not reaching it; a discal dot at three-fourths; an irregular transverse line from about three-fourths of costa to tornus, curved outwards from near costa to three-fourths, whence a sharp projection proceeds to touch lower side of preceding discal dot; a slender streak along termen; cilia white, barred with dark fuscous (imperfect). Hindwings white, thinly scaled; costa and apical fourth fuscous, darker towards apex; cilia white, on costa fuscous.

Hoyleton and Ardrossan, South Australia, in August; two specimens.

The form of the transverse line at three-fourths is a characteristic distinction.

Psecadia anthracopis, n. sp.

Female, 25 mm. Head blackish, back of crown white. Palpi blackish, apex of all joints white. Antennæ blackish.

Thorax blackish, four spots arranged in a square, and apical half of patagia white. Abdomen blackish, segmental margins white. Legs black, ringed with white. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen nearly straight, rather oblique; shining white, with blackish-fuscous markings; costal edge blackish-fuscous, interrupted near apex; a small costal spot at base, and a larger one near base, partly connected; a small dorsal spot at one-sixth; a transverse bar from costa at one-fifth, thickened upwards, reaching three-fourths across wing, interrupted on fold; a triangular spot on costa at two-fifths, its apex touching a discal dot; a small subdorsal spot before middle; a small costal spot beyond middle; a subcrescentic spot towards dorsum beyond middle; an elongate spot along costa at three-fourths, containing two white dots; a narrow terminal streak; cilia dark fuscous, spotted with white. Hindwings white, thinly scaled; costa and apical fifth fuscous; cilia white, round apical blotch fuscous mixed with white.

Adelaide, South Australia, in May (O. Lower); one specimen.

Very like the preceding, but larger, and the markings really differ a good deal in detail; the different color of head is an easy distinction. I have also a third species from Queensland (received by the kindness of Dr. A. J. Turner, who will describe it), which is closely allied to the two preceding, but still larger and quite distinct.

Psecadia heptasema, Turn.

(*Psecadia heptasema*, Turn., Trans. Roy. Soc., S. Austr., 1898, 213.)

A distinct species, of which I possess an example received from Dr. Turner. This shows the following modifications of his description; thorax also with two posterior black dots; abdomen light ochreous-yellow; forewings with a series of large black dots along termen, and apical part of costa; hindwings with tornal area whitish-ochreous, yellowish-tinged.

Psecadia hilarella, Walk.

(*Azinis hilarella*, Walk. Tin., 542; *Psecadia hilarella*, Turn., Trans. Roy. Soc., S. Austr., 1898, 213.)

This conspicuous species is sufficiently described by Dr. Turner. It is common throughout a large part of the Indo-Malayan region.

MACROBATHRA, Meyr.

Macrobathra xanthoplaca, n. sp.

Male, 16 mm. Head ochreous-yellow, collar and sides of crown dark fuscous. Palpi ochreous-yellow, terminal joint with longitudinal dark fuscous lateral lines. Antennæ whitish, ringed with dark fuscous. Thorax ochreous-yellow, anteriorly narrowly dark bronzy-fuscous. Abdomen ochreous-yellow. Legs ochreous-yellow, banded with dark fuscous. Forewings elongate-lanceolate; ochreous-yellow; markings dark golden-bronzy-fuscous; a moderate basal fascia, outer edge straight, rather oblique; a narrow slightly curved fascia before middle, and a straight fascia from three-fourths of costa to tornus, connected by an oblique bar from below middle of first to above middle of second; a terminal fascia, almost confluent beneath with preceding; cilia pale ochreous-yellowish, with broad dark bronzy-fuscous bars at apex and above tornus. Hindwings dark fuscous; a short ochreous-whitish median longitudinal streak from base, surrounded with brilliant prismatic scales; cilia bronzy-fuscous, becoming pale yellowish towards tornus.

Melbourne, Victoria (J. A. Kershaw); one specimen.

Macrobathra homocosma, n. sp.

Female, 16 mm. Head shining bronze. Palpi ochreous-white, terminal joint with longitudinal blackish lateral lines. Antennæ white, ringed with blackish. Thorax dark bronze. Abdomen pale ochreous-yellowish. Legs ochreous-whitish, with shining bronzy bands sprinkled with dark fuscous. Forewings elongate-lanceolate; deep shining bronzy-fuscous; markings shining white; a straight oblique fascia from one-fifth of costa to one-third of dorsum; a semi-oval spot on middle of costa, and a larger one at three-fourths; an elongate-triangular prætornal spot; cilia whitish mixed with fuscous (imperfect). Hindwings rather dark grey, lighter anteriorly; cilia whitish grey.

Duaringa, Queensland; in October (G. Barnard); one specimen.

Macrobathra galenæa, n. sp.

Female, 14 mm. Head whitish-ochreous. Palpi whitish-ochreous, terminal joint with longitudinal blackish lateral lines. Antennæ dark fuscous. Thorax dark fuscous, ashy-tinged. (Abdomen broken.) Legs dark fuscous, banded with whitish. Forewings elongate-lanceolate; blackish-fuscous; a

rather oblique whitish-ochreous fascia from one-fifth of costa, reaching two thirds across wing, narrowed beneath; two rounded whitish-ochreous spots on costa at one-half and four-fifths; plical and second discal stigmata whitish-ochreous; a small whitish-ochreous tornal spot; a basal suffusion, a fascia before middle, a second beyond middle not nearly reaching costa, and a spot beyond second discal stigma shining purplish-leaden; cilia dark fuscous, with a whitish-ochreous tornal suffusion. Hindwings grey, darker posteriorly; cilia grey.

Sydney, New South Wales, in April (G. Lyell); one specimen.

MACROBATHRA EPIMELA, Low.

(*Gelechia epimela*, Low., Trans. Roy. Soc., S. Austr., 1894, 106.)

This is a true *Macrobathra*. I have received the type.

BORKHAUSENIA, Hb.

This name applies to the genus termed *Oecophora* in my papers, the name *Oecophora* being otherwise employed.

BORKHAUSENIA SPHALEROPIS, n. sp.

Male, 18 mm. Head and thorax whitish irrorated with grey. Palpi white sprinkled with dark fuscous, second joint with oblique submedian and narrower apical dark fuscous bands, terminal joint blackish. Antennæ grey. Abdomen whitish-grey. Legs dark grey, ringed with whitish, posterior pair grey-whitish. Forewings elongate, narrow, costa gently arched, apex obtuse, termen very obliquely rounded; pale fuscous, irregularly and suffusedly mixed with whitish, and sprinkled with dark fuscous; an undefined longitudinal streak of dark fuscous suffusion along submedian fold towards base; stigmata very indistinctly indicated, subelongate, dark fuscous, plical obliquely before first discal (but hardly traceable); a faint darker angulated subterminal line; cilia whitish, basal half tinged with fuscous and sprinkled with dark fuscous. Hindwings whitish-fuscous, paler anteriorly; cilia whitish.

Gisborne, Victoria, in May (G. Lyell); one specimen.

BLASTOBASIS, Zell.

Head with appressed hairs; tongue developed. Antennæ two-thirds, in male fasciculate-ciliated (2), with sinuation and notch on upper side above basal joint, suprabasal joint swollen, basal joint in male very broadly dilated and sub-concave beneath, in female moderately dilated, with strong pecten.

Labial palpi moderately long, recurved, second joint thickened with dense appressed scales, more strongly in male, terminal joint shorter than second, in male more or less thickened with dense appressed scales, obtuse or acute, in female moderate, acute. Posterior tibiæ clothed with long hairs above. Forewings: 2 and 3 from angle of cell, 4 and 5 closely approximated, connate, or stalked, 7 and 8 stalked, 7 to costa, 9 and 10 approximated at base, 11 from before middle of cell. Hindwings two-thirds, lanceolate, cilia 2¼; 2 remote, 4 absent, 3 and 5 connate or stalked, 6 and 7 tolerably parallel.

A small but very widely distributed genus, with many structural peculiarities. It is a much specialised form in a line of development (probably ancient and once more prevalent than now), of which the three following genera are earlier and little specialised forms, these latter being, in fact, amongst the most primitive of the *Oecophoridæ*. The species are in all regions obscure and closely allied, and require careful attention for their discrimination.

BLASTOBASIS SARCOPHAGA, n. sp.

Male and female, 17-25 mm. Head, palpi, and thorax rather dark shining ochreous-fuscous, more or less mixed with whitish-ochreous; second joint of palpi whitish-ochreous at apex, and on upper half internally, terminal joint acute in both sexes. Antennæ fuscous. Abdomen pale brownish-ochreous, segments with dark bronze median bar. Legs dark fuscous, ringed with whitish-ochreous, hairs of posterior tibiæ whitish-ochreous. Forewings elongate, narrow, long-pointed; bronzy-fuscous, suffusedly mixed with whitish-ochreous and sometimes with dark fuscous, in one specimen much suffused with rather dark fuscous; a cloudy angulated dark fascia before middle, followed by an obscure pale costal spot; a transverse series of three obscure dark spots from three-fourths of costa to tornus, central spot rather nearer base than others; a series of alternate pale and dark spots round termen and posterior part of costa; cilia pale whitish-fuscous, basal half mixed with fuscous. Hindwings fuscous-whitish, becoming light fuscous posteriorly; cilia pale whitish-fuscous.

Sydney, New South Wales, in November, February, and April; five specimens.

Easily distinguished by its large size and especially dark or darkly-marked forewings, contrasting with the especially pale hindwings; also in the male by the acute apex of palpi (which in the next species, the only one comparable with it in

size, is especially obtuse), and absence of any sexual tornal suffusion. Mr. George Masters gave me a specimen which he bred from a larva feeding on dried skins, and my other examples were all taken near houses; it is, therefore, probably semi-domestic, living on dried animal refuse, and may, perhaps, be found to occur also in other countries; the other species, however, occur in native bush, and show no sign of similar habits.

BLASTOBASIS TARDA, n. sp.

Male, 13-16 mm.; female, 15-21 mm. Head and thorax light brownish-ochreous, sometimes infuscated. Palpi pale brownish-ochreous, in male with second joint suffused with dark fuscous towards base, with an ochreous-whitish well-defined patch covering upper part of its apical two-thirds on inner side, in female irrorated with fuscous or dark fuscous, terminal joint in male obtuse. Antennæ brownish-ochreous. Abdomen whitish-ochreous. Legs pale ochreous, banded with dark fuscous. Forewings elongate, very narrow, long-pointed; light brownish-ochreous, more or less suffusedly mixed with fuscous; two very indistinct slender dark fuscous transverse fasciæ, first at two-fifths, angulated in middle, second at three-fourths, straight, slightly oblique inwards, tending to be broken into three spots; two or three indistinct dark fuscous marginal dots round apex; cilia pale brownish-ochreous. Hindwings pale brownish-ochreous, more or less infuscated except towards base, in male with reddish-fuscous suffusion towards tornus; cilia pale brownish-ochreous.

Rosewood and Brisbane, Queensland; Newcastle and Sdney. New South Wales; in June, and from August to January, common.

May be known from the three following by its ochreous tinge, they being all grey without ochreous tinge; the male is specially distinguished by the defined pale patch on second joint of palpi internally, and reddish-fuscous tornal suffusion of hindwings.

BLASTOBASIS NEPHELIAS, n. sp.

Male, 15-16 mm. Head and thorax grey, whitish-sprinkled. Palpi whitish-ochreous, externally mixed with dark fuscous, apex in male obtuse. Antennæ grey, apex of basal joint whitish. Abdomen grey, anal tuft whitish-ochreous. Legs ochreous-whitish irrorated with dark fuscous, with pale rings. Forewings elongate, very narrow, long-pointed; grey, irrorated with whitish, with some scattered dark grey scales; plical

stigmata dark fuscous, elongate; a dark fuscous tornal dot, and another in disc directly above it; cilia pale fuscous, whitish-sprinkled. Hindwings grey, paler and ochreous-tinged towards base, with a dark grey irroration towards tornus; cilia pale fuscous, towards tornus ochreous-tinged.

Perth and Albany, West Australia, in October and December; two specimens.

Most approaches the preceding, but grey, and with the markings reduced to three defined dots; palpi in male without the characteristic pale patch.

BLASTOBASIS LEUCOTOXA, n. sp.

Male and female, 9-14 mm. Head and thorax fuscous irrorated with white. Palpi in male whitish-ochreous, externally suffused with fuscous, apex obtuse, in female dark fuscous, sprinkled with white, tips of joints white. Antennæ fuscous. Abdomen whitish-fuscous, apex pale ochreous-yellowish. Legs dark fuscous, irrorated and ringed with whitish, hairs of posterior tibiæ whitish. Forewings elongate, narrow, long-pointed; fuscous, more or less suffusedly mixed with white and sprinkled with dark fuscous; a slender angulated dark fuscous fascia at two-fifths, sometimes interrupted, edged anteriorly by a suffused white band; a slightly inwards-curved transverse series of three dark fuscous dots at three-fourths, costa often obsolete; cilia whitish-fuscous. Hindwings pale grey, in male with an ochreous or pale fuscous suffusion towards tornus; cilia whitish-grey-ochreous.

Sydney, New South Wales; Launceston, Tasmania; Geraldton, West Australia; in September, November, January, and February, common.

This and the next species are markedly smaller than the others, and the sexes do not differ noticeably in size, as they do in *B. tarda*. The present species is well distinguished from all others by the white band preceding the dark antemedian fascia; the dark markings are much more conspicuous than usual.

BLASTOBASIS HOMADELPHA, n. sp.

Male and female, 10-13 mm. Head and thorax fuscous, sometimes whitish-sprinkled. Palpi fuscous mixed with dark fuscous, in male internally pale greyish-ochreous, apex obtuse. Antennæ fuscous. Abdomen pale fuscous, extreme apex in female orange, anal tuft in male brownish-ochreous. Legs dark fuscous, paler-ringed. Forewings elongate, very narrow, long-pointed; light fuscous, irrorated with dark fuscous, some-

times with a few ashy-whitish scales; very undefined darker fasciæ at two-fifths and three-fourths, often obsolete, anterior angulated; cilia light fuscous. Hindwings fuscous, paler anteriorly, in male with tornus ochreous-tinged, with a streak of dark fuscous suffusion above it; cilia light ochreous fuscous.

Duaringa and Brisbane, Queensland; Murrurundi and Sydney, New South Wales; Port Lincoln, South Australia; in September, November, and March, common.

Very like the preceding, but much more obscure, slightly narrower-winged, and without the white suffusion.

MIXODETIS, n. g.

Head with appressed hairs; tongue developed. Antennæ three-fourths, in male shortly ciliated (1), basal joint moderate, with strong pecten. Labial palpi moderate, curved, ascending, second joint not reaching base of antennæ, slightly rough beneath, with scales somewhat angularly projecting towards apex, terminal joint shorter than second, roughened with scales anteriorly, pointed. Posterior tibiæ clothed with long hairs above and beneath. Forewings: 2 from angle, 4 absent, 7 and 8 stalked, 7 to termen, 11 from middle of cell. Hindwings two-thirds, lanceolate, cilia 2; 3 and 4 remote, nearly parallel.

Type *M. ochrocoma*, Low.

Mixodetis ochrocoma, Low.

(*Paratheta ochrocoma*, Low., Proc. Linn. Soc., New South Wales, 1899, 100.)

I am indebted to Mr. Lower for examples of this species.

Mixodetis calyptra, Low.

(*Paratheta calyptra*, Low., Proc. Linn. Soc., New South Wales, 1899, 100.)

Of this also I received specimens from Mr. Lower.

PERIALLACTIS, n. g.

Head smooth; tongue developed. Antennæ three-fourths, in male rather strongly ciliated ($2\frac{1}{2}$), basal joint moderately elongate, with pecten. Labial palpi moderately long, recurved, second joint reaching base of antennæ, with loose scales beneath somewhat dilated towards apex, terminal joint almost as long as second, slender, acute. Posterior tibiæ clothed with hairs above and beneath. Forewings: 2 from angle, 7 and 8 stalked, 7 to termen, 11 from before middle of cell. Hindwings under 1, ovate-lanceolate, cilia $1\frac{1}{4}$; 3 and 4 separate, more or less approximated.

Closely allied to *Paratheta*, but with vein 7 of forewings running to termen.

PERIALLACTIS MONOSTROPHA, LOW.

(*Aristotelia monstropha*, Low., Trans. Roy. Soc., S. Austr., 1897, 57.)

Male, 12-16 mm. Head, palpi, and thorax fuscous mixed with white. Antennæ fuscous. Abdomen pale fuscous. Legs fuscous, posterior pair ochreous-whitish. Forewings elongate-lanceolate; fuscous, suffusedly irrorated with white; a moderate longitudinal white streak above middle from base to apex, upper edge rather indefinite, lower well-marked, indented in middle and before three-fourths, indicating discal stigmata; fold darkened anteriorly; cilia pale whitish-fuscous. Hindwings fuscous-whitish, becoming pale fuscous posteriorly; cilia ochreous-whitish.

Gisborne, Victoria, in February and March (G. Lyell); six specimens.

Recorded by Mr. Lower from Broken Hill, New South Wales. I have seen his type.

PARATHETA, n. g.

Head with appressed hairs; tongue developed. Antennæ three-fourths, in male moderately or rather strongly ciliated (1-2½), basal joint moderate, with pecten. Labial palpi moderate, curved, ascending, second joint somewhat loosely scaled beneath, not nearly reaching base of antennæ, terminal joint shorter, slender, acute. Posterior tibiæ clothed with very long hairs above and beneath. Forewings: 2 from angle, 7 and 8 stalked, 7 to costa, 11 from before middle of cell. Hindwings somewhat under 1, lanceolate, cilia 1⅔; 3 and 4 remote.

Type *P syrtica*.

PARATHETA SPODOSTROTA, n. sp.

Male, 16 mm. Head, palpi, and thorax bronzy-fuscous sprinkled with whitish. Antennæ fuscous, ciliations 2½. Abdomen light grey. Legs dark fuscous ringed with whitish, posterior pair whitish. Forewings elongate, costa moderately arched, apex acute, termen extremely oblique, faintly sinuate; bronzy-fuscous, irrorated with white, with a longitudinal white suffusion in disc from two-fifths to four-fifths, and some scattered dark fuscous scales; a dark basal suffusion; an irregular dark fuscous bar from costa beyond one-third, reaching two-thirds across wing, dilated in disc into an irregular spot; an irregular dark fuscous dot above white

discal suffusion at two-thirds; cilia whitish-fuscous, basal half sprinkled with fuscous. Hindwings whitish-fuscous; cilia very pale whitish-fuscous.

Blackheath (3,500 ft.), New South Wales, in September; one specimen.

Easily known by the dark antemedian costal bar.

PARATHETA PHILOSCIA, n. sp.

Male and female, 12-15 mm. Head, palpi, and thorax fuscous, irrorated with whitish. Antennæ pale fuscous, ciliations in male (2½). Abdomen pale fuscous. Legs fuscous, posterior pair ochreous-whitish. Forewings elongate-lanceolate; fuscous, obscurely irrorated with whitish, with scattered dark fuscous; stigmata dark fuscous, plical obliquely before first discal; sometimes a small dark fuscous tornal spot; cilia whitish-fuscous, round apex fuscous sprinkled with whitish. Hindwings whitish-fuscous, darker posteriorly; cilia whitish-fuscous.

Sydney, New South Wales; Gisborne, Victoria; Quorn and Wirrabara, South Australia; in October and November, six specimens.

Distinguished from *P. syrtica* by the absence of the median longitudinal streak of whitish suffusion; the male also differs structurally by the much stronger antennal ciliations.

PARATHETA SYRTICA, n. sp.

Male and female, 12-15 mm. Head and thorax fuscous, whitish-mixed. Palpi rather dark fuscous. Antennæ fuscous, ciliations of male (1). Abdomen fuscous. Legs dark fuscous, whitish-ringed, hairs of posterior tibiæ whitish. Forewings elongate-lanceolate; fuscous, sprinkled with dark fuscous, more or less irrorated with white, with a more or less undefined broad median longitudinal streak of white suffusion; stigmata moderate, dark fuscous, plical very obliquely before first discal; cilia light fuscous, round apex whitish-sprinkled. Hindwings grey, lighter anteriorly; cilia pale greyish-ochreous.

Brisbane, Queensland; Sydney and Bathurst, New South Wales, Launceston, Campbelltown, and Hobart, Tasmania; from August to December, common.

An obscure-looking but easily recognised species.

New Australian Lepidoptera.

By A. Jefferis Turner, M.D., F.E.S.

[Read July 1, 1902.]

The insects described in the present paper belong to various families. Most of them have been in my possession for some time, and they include among others a number of interesting forms, mostly bred from the larvæ, for which I am indebted to Mr. F. P. Dodd, of Townsville. The types of the family *Xyloryctidæ* collected by Mr. Dodd are in the collection of Lord Walsingham, to whom I am indebted for permission to describe them. There are co-types in my own collection. I have also described several species received from Mr. G. Lyell, jun., of Gisborne, from Mr. H. Tryon, Queensland Government Entomologist, and Mr. R. Illidge, of Brisbane.

Among the genera, and almost equally among the families, usually loosely known as "*Bombyces*," there exists at present great confusion in Australian collections. A revision of these families is much needed, and I hope, when time and material (much of it scarce and difficult to obtain) permit, to undertake this, a task in which my recent opportunities of examining Walker's types in the British Museum should prove of service. The *Notodontidæ* I have already in hand, and hope to publish shortly. In the present paper I have received much help by the study of the family and generic definitions in Sir George Hampson's "Moths of India," and in the introduction to his "Catalogue of the Lepidoptera Phalaenæ."

In several instances I have found, after writing my descriptions, that I had been anticipated in the naming of the species, but I have published them, in the hope that they may prove serviceable.

LYMANTRIADÆ.

Porthesia euthysana, n. sp.

Male, 26-30 mm. Head white, mixed with a few ochreous scales on crown. Palpi white, with long ochreous hairs on base beneath. Antennæ whitish-grey. Thorax white, mixed with ochreous. Abdomen dark fuscous; apices of segments and tuft white. Legs white; anterior coxæ, femora, and tibiæ ochreous anteriorly. Forewings triangular, costa strongly arched, apex rounded, termen rounded, oblique; clear white;

costal edge near base ochreous; cilia white; along dorsal margin a fringe of large bright-ochreous scales. Hindwings with termen rounded; white; cilia white.

Mount Tambourine, Queensland, in November and February; four specimens.

PORTHESIA PANABRA, n. sp.

Male, 24-26 mm.; female, 40 mm. Head, thorax, and antennæ white. Palpi white. Abdomen white; tuft bright ochreous. Legs white. Forewings triangular, costa strongly arched, apex rounded, termen rounded, oblique; clear white; costal edge near base ochreous; cilia white; along dorsal margin a fringe of white scales, mixed with a few larger pale ochreous scales. Hindwings with termen rounded; white; cilia white.

Closely allied to the preceding, but the abdomen is white, and ochreous coloring much less pronounced.

Brisbane and Mount Tambourine, Queensland, in March and April; three specimens.

PORTHESIA GALACTOPIS, n. sp.

Male, 18-25 mm.; female, 26-30 mm. Head, thorax, and antennæ white. Palpi white, external surface in male pale ochreous. Abdomen white; tuft ochreous, in male sometimes whitish. Legs white; anterior pair in male ochreous-tinged. Forewings triangular, costa rather strongly arched, especially in female, apex rounded, termen oblique, scarcely rounded in male, rounded in female; dull milk-white; base of costal edge ochreous in male; cilia white. Hindwings with termen rounded; white; cilia white.

Best distinguished from the preceding by the absence of ochreous scales on dorsal margin of forewings.

Mareeba and Townsville, Queensland, from May to October; common.

PORTHESIA FIMBRIATA, Luc.

(*Teara fimbriata*, Luc. Proc. Linn. Soc., N.S.W., 1891, p. 285.)

Forewings of male pale ochreous-yellow, more or less suffused with purple-grey, leaving a wavy-margined ochreous-yellow terminal band, and sometimes also a costal streak of the same color; cilia ochreous-yellow. Hindwings ochreous-whitish; cilia pale ochreous. Female with both wings and cilia whitish.

Stradbrooke Island, Queensland, in October; locally common.

Porthesia lutea, Fab.

(*Artaxa chrysophila*, Wlk. Suppl. 334; ?*Artaxa varians*, Wlk., iv., 796; *Porthesia iobrota*, Meyr. Trans. Roy. Soc., S.A., 1891, p. 194; *Artaxa chrysophœa*, Luc. Proc. Linn. Soc., N.S.W., 1892, *nec* Wlk.

This species varies in size and intensity of coloring, specimens from southern Queensland excelling in both respects. There is a variety occasionally met with in both sexes with hindwings irrorated with fuscous.

Cairns, Kuranda, Townsville, Rockhampton, and Brisbane, Queensland; common.

Euproctis chionitis, n. sp.

Male, 25-29 mm.; female, 31-35 mm. Head white, tinged with pale ochreous on crown. Pale ochreous. Antennæ white. Thorax and abdomen white; tuft in male white or orange, in female ochreous. Legs white; anterior coxæ and inner surface of anterior femora and tibiæ bright ochreous in male. Forewings triangular, costa rather strongly arched, apex rounded, termen oblique, rounded; snow white; base of costal edge ochreous; cilia white. Hindwings with termen rounded; color and cilia as forewings.

Vein 9 of forewings is absent in this species.

Cardwell and Brisbane, Queensland; common.

This species has stood in collections as *obsoleta*, Fab. I have seen the Fabrician type of *obsoleta* in the British Museum, and identify it with *Laelia eremœa*, Meyr.

Euproctis amphideta, n. sp.

Male, 26 mm. Head, palpi, and antennæ pale yellow. Thorax and abdomen ochreous-yellow. Legs pale yellow. Forewings triangular, costa rather strongly arched, apex rounded, termen slightly rounded, slightly oblique; vein 9 absent; orange-ochreous, suffused with pale grey except near costa, and a spot in disc beneath mid-costa; a pale yellowish terminal band, indented at two-fifths of termen; cilia pale yellowish. Hindwings with termen rounded; ochreous-yellow; cilia pale yellowish.

This pretty species recalls *Porthesia fimbriata*, Luc., in its markings.

Townsville, Queensland, in March and April; two specimens received from Mr. F. P. Dodd.

EUPROCTIS CHRYSOPHÆA, Wlk.

(*Orgyia chrysophæa*, Wlk. Suppl. 324; *Artaxa cervina*, Moore. Ann. Nat. Hist., 1877, 345, Lep. Ceylon, pl. 112, f. 3; *Artaxa lucifuga*. Luc. Proc. Linn. Soc., N.S.W., 1892, 250.)

Male, 17-21 mm. Forewings fuscous-orange or orange-ochreous, with two pale transverse lines, median and post-median, the first usually obsolete, the second often indistinct; in pale varieties the space between lines may be occupied by a darker fuscous; cilia deep yellow. Hindwings dark grey, without orange or ochreous tinge; cilia yellow.

Female, 25 mm. Forewings elongate-oval; pale ochreous; cilia pale ochreous. Hindwings whitish-grey; cilia pale ochreous.

The males are very variable in depth of coloring, appearing on the whole to be darker in cool, paler in hot climates.

Townsville and Brisbane, Queensland; the males not uncommon, the female rarely taken; also from India and Africa. Walker's type is from Abyssinia.

EUPROCTIS HOLOXUTHA, n. sp.

Male, 36 mm. Head, palpi, antennæ, and thorax dull orange-ochreous. Abdomen deep orange, tuft but slightly paler. Legs pale ochreous. Forewings triangular, costa moderately arched, apex round-pointed, termen slightly rounded, oblique; dull orange-ochreous; a pale ochreous spot in disc beneath two-fifths costa; cilia ochreous. Hindwings with termen rounded; pale yellow, towards inner margin suffused with orange; cilia pale yellow.

This appears to be doubtfully distinct from *E. crocea*, Wlk., of which I only know the type (a female) in the British Museum, said to be from Moreton Bay. Further material is desirable.

Townsville, Queensland, in August; one bred specimen in perfect condition received from Mr. F. P. Dodd. There are a male and female of this species in the British Museum from Adelaide River, North Australia; and another pair in the Queensland Museum.

EUPROCTIS SCOTOCHYTA, n. sp.

Male, 16 mm. Head, palpi, and thorax deep yellow. Antennæ yellowish. Abdomen grey; tuft and sometimes apices of segments pale ochreous. Legs whitish-ochreous. Forewings triangular, costa moderately arched, apex rounded, termen rounded, oblique; dark grey, with scattered ochreous scales, towards base and sometimes towards costa suffused with

ochreous-yellow; costal edge ochreous-yellow; cilia pale ochreous. Hindwings with termen rounded; dark grey; cilia grey or whitish-ochreous.

Allied to *E. chrysophœa*, Wlk., but smaller, and with the wings nearly concolorous.

Kuranda and Townsville, Queensland, in October and January; two specimens. I should like to see the female of this species.

EUPROCTIS ARROGANS, Luc.

(*Artaxa arrogans*. Luc. Trans. Roy. Soc., Queensland, 1899, 140.)

Male and female, 44-46 mm. Head, thorax, abdomen, and forewings reddish-orange; apical tuft of abdomen white. Hindwings ochreous or orange-ochreous.

I think this is Lucas' species, though he does not mention the white tuft of abdomen.

Cairns and Johnstone River, Queensland, in June and November; two specimens. There is a female in the British Museum from Woodlark Island.

EUPROCTIS HABROSTOLA, n. sp.

Male, 43 mm.; female, 58 mm. Head, thorax, and antennæ whitish-ochreous. Face and palpi ochreous. Abdomen blackish, towards base ochreous; lower surface ochreous; tuft whitish. Legs whitish-ochreous. Forewings triangular, costa moderately arched, apex rounded, termen slightly rounded, oblique; creamy-whitish without markings; cilia creamy-whitish. Hindwings with termen rounded; deep yellow; base to one-third suffused in female with dark fuscous, which extends whole length of inner margin; cilia yellow.

Allied to *E. uniformis*, Moore, from India.

Townsville, Queensland, in March; one specimen bred by Mr. F. P. Dodd from a larva feeding on *Melaleuca*. There is a male from Rockhampton, Queensland, in the Queensland Museum.

EUPROCTIS NIPHOBOLA, n. sp.

Male and female, 37-42 mm. Head, thorax, palpi, and antennæ fuscous; face in male brown, in female fuscous. Abdomen dark fuscous; tuft in male ochreous in female grey. Legs fuscous. Forewings elongate-triangular, costa moderately arched, apex round-pointed, termen very oblique, in male straight, in female slightly rounded; fuscous, sparsely irrorated with large triangular white scales, more densely in posterior part of disc; a dark fuscous discal dot

beneath mid-costa; a straight suffused sub-terminal white shade, better marked in female; a row of white spots along termen, better marked and confluent on margin in female; cilia fuscous. Hindwings with termen but slightly rounded; fuscous; a whitish terminal band, intersected by veins, narrowing to a point at ternus.

Allied to *baliolalis*, Swin., which is also referable to this genus.

Brisbane (male type), Queensland, in February. The female (sent by Mr. F. P. Dodd) from Townsville, Queensland, in September.

ACNISSA, n. g.

Head normal. Tongue weak. Palpi obliquely porrect, moderate, one and a half times breadth of eye, terminal joint minute. Antennæ bipectinated in both sexes, more shortly in female. Thorax loose-scaled, with an erect posterior crest. Abdomen smooth, slender in both sexes. Legs normal. Forewings with vein 2 from two-thirds, 3 from before angle, 4 from angle, 5 from cell well separated from 4, 6 from below upper angle of cell, 7 from upper angle, 8, 9, 10 stalked from before angle, well separated from 7. Hindwings with 3 and 4 approximated at base, 5 nearer 4 than 6, 6 and 7 connate, 8 anastomosing shortly with cell near base.

Allied to *Euproctis*, but at once distinguished by the wide separation of vein 7 from 8, 9, 10.

ACNISSA PYRRHIAS, n. sp.

Male and female, 16-20 mm. Head, thorax, and palpi bright reddish-brown. Antennæ grey. Abdomen ochreous, more or less suffused with fuscous. Legs fuscous; posterior pair whitish-ochreous. Forewings elongate-triangular, costa strongly arched at base, thence nearly straight, apex somewhat pointed, termen straight, rounded beneath, slightly oblique; dull reddish, sparsely irrorated with fuscous; a fuscous transverse fascia, anterior edge dentate from one-fourth costa to one-third dorsum, posterior edge also dentate from slightly beyond mid-costa to dorsum at two-thirds; on each border of fascia is a suffused brighter red line; a faint dark sub-terminal shade; a fine fuscous terminal line; cilia reddish, apices fuscous. Hindwings with termen rounded, fuscous, base pale reddish, sometimes wholly pale reddish; cilia reddish.

Townsville, Queensland, from December to May; three specimens received from Mr. F. P. Dodd.

Lymantria aurora, Wlk. (?)

I describe this species by the name by which it is known in Australian collections, but have not been able to discover Walker's description. It is not contained in the British Museum catalogue.

Male, 52 mm. Head whitish; posterior margin narrowly red. Palpi dark fuscous; apex whitish. Antennæ black, pectinations whitish. Thorax whitish. Abdomen bright red; a whitish basal spot; a series of four median blackish spots on apical segments; tuft ochreous. Legs whitish, mixed with red, tarsi annulated with black. Forewings triangular, costa moderately arched, apex round-pointed, termen slightly rounded, oblique; grey-whitish, markings dark fuscous; extreme base of costal edge red; a spot on base of costa, and another on mid-base; a spot beneath costa at one-eighth, and another beneath it on fold; a thick wavy line from one-fourth costa to two-fifths dorsum; a small median discal dot; a thick wavy sigmoid line from costa just beyond middle to dorsum at two-thirds; a fine acutely dentate line from costa at three-fourths to before tornus, partly confluent with previous line near dorsum; a row of terminal dots; cilia grey-whitish. Hindwings with termen rounded; ochreous-whitish suffused with pale red, especially towards costa and inner margin; cilia whitish, at apex and inner margin ochreous-reddish.

Female with wings aborted; whitish; forewing crossed by two interrupted dark fuscous lines beyond middle. Head and thorax whitish. Antennæ whitish, pectinations black. Abdomen very large; pale ochreous-brown.

Closely allied to *L. antennata*, Wlk., which has fuscous hindwings, and the markings of forewings more suffused.

Townsville, Queensland, in June; a pair received from Mr. F. P. Dodd, who says the larvæ feed on *Eucalyptus tessellaris* and other trees, and to pupate suspend themselves among a few golden-colored threads under leaves or between loose strips of bark.

Laelia ostracina, n. sp.

Female, 36 mm. Head, palpi, and thorax whitish. Antennæ broken. Abdomen ochreous-whitish. Legs whitish. Forewings elongate-triangular, costa rather strongly arched, apex round-pointed, termen slightly rounded, oblique; white; a longitudinally oval spot in disc near base, reddish-brown mixed with dark fuscous; a large irregularly shaped irroration in disc beyond middle, of reddish-brown and dark fuscous, touching costa, broadest towards costa, narrowing towards and

not reaching dorsum; an incomplete interrupted narrow dark fuscous sub-terminal line; cilia white. Hindwings with termen rounded; white; cilia white.

Cooktown, Queensland; one specimen in Coll. Lyell.

ANTHELA PHŒNICIAS, n. sp.

Male, 36-42 mm. Head, palpi, antennæ, thorax, and abdomen vinous-purple. Legs vinous-purple. Forewings triangular, costa straight, apex rounded, termen rather strongly bowed, slightly oblique; vinous-purple without markings; cilia vinous-purple. Hindwings with termen rounded; vinous-purple; cilia vinous-purple.

The coloring is uniform throughout. There is a specimen of this species unnamed in the British Museum. It does not correspond to any of Walker's types.

Brisbane and Stanthorpe, Queensland, in January and February; two specimens. There is also a specimen in Coll. Lyell from Roeburne, North-West Australia.

Anthela (type *ferruginosa*, Wlk., iv., 854) includes and supersedes *Darala* (type *ocellata*, Wlk., iv., 887.)

ANTHELA ASPILOTA, n. sp.

Female, 44 mm. Head, palpi, antennæ, thorax, abdomen, and legs pale brownish-ochreous. Palpi with loose spreading hairs. Forewings triangular, costa moderately arched, apex rounded, termen rounded, oblique, rather thinly scaled; pale brownish-ochreous; cilia pale brownish-ochreous. Hindwings with termen rounded; vein 8 connected by a bar with cell; pale brownish-ochreous; cilia pale brownish-ochreous.

Another unicolorus species for which I can find no name.

Stanthorpe, Queensland, in January; one specimen.

ANTHELA NEUROSPASTA, n. sp.

Male, 38 mm. Head, thorax, and abdomen whitish; face and palpi ochreous. Antennæ whitish, pectinations brownish-fuscous. Legs fuscous, posterior surfaces whitish. Forewings triangular, costa straight, slightly arched towards apex, apex rounded, termen strongly rounded, slightly oblique; whitish, with pale fuscous streaks; a streak along costa, a second from disc at one-fourth to termen, a third along fold and continued to tornus; six shorter streaks running into termen, three above and three beneath median streak; cilia whitish. Hindwings with termen rounded; color and markings as forewings, but costal streak absent, and dorsal streak not continued to base.

Cooktown, Queensland; one specimen in Coll. Lyell.

EUPTEROTIDÆ.

Epicoma zelotes, n. sp.

Male, 30-33 mm. Head whitish, face ochreous. Antennæ dark grey. Thorax pale grey. Abdomen blackish; tuft and a series of median spots ochreous. Legs dark fuscous, mixed with ochreous. Forewings elongate-triangular, costa slightly arched, apex round-pointed, termen rounded, oblique; snow-white; costa and dorsal margin irrorated with dark fuscous and ochreous; a roundish discal spot beneath mid-costa, ochreous margined with dark fuscous; an inwardly oblique, slightly sigmoid, broad, ochreous-fuscous line from costa at four-fifths to dorsum at three-fourths; cilia bright ochreous, apices and a series of 4 basal spots dark fuscous. Hindwings with termen rounded; yellow-ochreous; a narrow blackish fascia at four-fifths, parallel to termen; a faint fuscous sub-terminal line; cilia ochreous.

Female differs as follows: 34-36 mm. Face grey. Forewings more irrorated and oblique line paler. Hindwings dark fuscous, extreme base whitish-ochreous, with a terminal series of ochreous spots.

There is a closely allied species in the British Museum from Adelaide River, North Australia.

Townsville, Queensland, in November and December; four specimens received from Mr. F. P. Dodd, who bred them from larvæ feeding gregariously on *Eucalyptus platyphylla*, hiding by day at the foot of the tree or under loose bark. There is also a male specimen in Coll. Lyell from Cape York, Queensland. The last has the hindwings less brightly colored, and with a broader dark band than the Townsville specimens.

Epicoma asbolina, n. sp.

Female, 36 mm. Head, antennæ, and thorax blackish. Abdomen blackish; tuft ochreous. Legs blackish. Forewings triangular, costa gently arched, apex round-pointed, termen rounded, oblique; brown-whitish, costal and dorsal edge and a broad terminal band suffused with blackish; a blackish discal spot beyond middle; a terminal series of large oval or oblong white spots; cilia blackish. Hindwings with termen rounded; blackish; sub-terminal spots and cilia as forewings.

Townsville, Queensland, in June; one specimen received from Mr. F. P. Dodd. There is a female specimen in the Queensland Museum from Bowen, Queensland, and another in the British Museum from Port Darwin, North Australia.

BOMBYCIDÆ.

OCINARA LEWINÆ, Lew.

(*Clisiocampa lewinæ*, Lew. Prodr. Ent. 7, t. 6, 1807; *Pamea transiens*, Wlk., v., 1156; *Oreta sobria*, Wlk., v., 1168; *Eriogaster simplex*, Wlk., vi., 1473; *Naprepa pilosa*, Wlk., Suppl. 489; *Naprepa hirta*, Wlk., Suppl. 490; *Trilocha rufescens*, Wlk., Suppl. 546; *Semuta pristina*, Wlk., Suppl. 547.)

Walker described this species seven times in six different genera, referred to four different families. This should be a warning to later authors, as showing how uselessly the study of entomology may be rendered more difficult by the description of species without accurate investigation of their structural characters.

I have verified this synonymy from the types in the British Museum. The two sexes differ, and both are variable, but not to any extraordinary degree.

Brisbane, Queensland; the larvæ feed gregariously on *Tristania conferta*.

ANDRACA ADOXIMA, n. sp.

Male, 42 mm. Head, whitish-ochreous. Antennæ grey. Thorax pale reddish-brown. Abdomen whitish-ochreous. Legs brownish. Forewings triangular, costa straight to near apex, apex rounded, termen long, rounded, strongly oblique; pale ochreous-grey towards base suffused with pale reddish-brown; an outwardly curved reddish-brown line from costa at one-third to dorsum at three-fifths; a broader line from costa at two-thirds to dorsum at four-fifths; a faintly marked spot in disc beneath mid-costa; cilia reddish-brown. Hindwings with termen strongly bowed, inner margin curved downwards, reddish-brown; a pale ochreous-grey terminal band, broad at apex, thence narrowing and not reaching tornus; cilia pale ochreous-grey.

This and the preceding are the only Australian species of *Bombycidæ* known to me.

Brisbane, Queensland; one specimen.

LASIOCAMPIDÆ.

CREXA HYALOESSA, n. sp.

Male, 30-32 mm. Head white. Palpi brown; base of second joint with a white spot on under surface. Antennæ fuscous. Thorax fuscous, mixed with white. Abdomen dark fuscous, sometimes with a few white scales on dorsum. Legs fuscous mixed with whitish. Forewings elongate-triangular, costa nearly straight to near apex, slightly sigmoid, apex round-

pointed, termen long, slightly rounded, very oblique; translucent, being only very thinly covered with fine blackish hairs except along costa and dorsum, and at apex, base, and discal spot; costal half of basal area whitish, dorsal half dark fuscous mixed with whitish and brownish; a fine white line from one-fourth costa to one-third dorsum; a broad brown streak irrorated with white scales along dorsum to tornus; an oval black spot above mid-dorsum; a black discal spot at end of cell; veins outlined in brownish mixed with whitish; a white dot on costa at three-fourths, from which a faint oblique slightly sigmoid white line proceeds to dorsum at two-thirds; a fuscous suffusion at apex; two black dots sometimes followed by a third minute dot between veins near apex; a very fine crenate white sub-terminal line immediately follows these, and is continued to dorsum; cilia very short, blackish tipped with whitish. Hindwings produced at tornus, termen slightly rounded; translucent with veins outlined as in forewings; towards inner margin covered with long grey hairs mixed with whitish; a white line from two-thirds costa to tornus; cilia as forewings.

Closely allied to *Crexa punctigera*, Wlk., *anthraxoides*, Wlk.), but differs in having only a single discal spot and the sub-terminal spots mostly obsolete.

Brisbane, Queensland, January to March; four specimens.

Crexa punctigera, Wlk.

(*Entometa punctigera*, Wlk., iv., 974 (male); *Mecytha trimacula*, Wlk., v., 1122 (female); *Crexa anthraxoides*, Wlk., Suppl. 1927 (male); *Dichromosoma majus*, Feld., pl. lxxxiii., f. 26 (female).

Mr. Lyell informs me that he took six similar larvæ in a crevice in the bark of *Exocarpus cupressiformis*, and bred two males and three females.

Clathe pyrsocoma, n. sp.

Male, 28 mm.; female, 36 mm. Head, palpi, and thorax purple-reddish. Antennæ purple-reddish, pectinations whitish-ochreous. Abdomen purple-reddish. Legs purple-reddish. Forewings triangular, costa in male straight to near apex, in female gently rounded, apex round-pointed, termen rounded, slightly oblique; dull-reddish finely irrorated with whitish hairs; dorsum sometimes narrowly suffused with fuscous; a median fuscous discal dot; in female a fine, crenulate, outwardly curved line from three-fifths costa to mid-dorsum, obsolete in male specimen; a sub-terminal series of minute fus-

cous dots; cilia reddish mixed with fuscous and whitish. Hindwings with termen rounded; purple-reddish; cilia reddish.

Brisbane, Queensland; two specimens taken by Mr. R. Illidge.

I think that Walker's genera—*Clathe*, *Callia*, and *Sitina*—may have ultimately to be merged in one.

Clathe anthracica, n. sp.

Male, 32 mm. Head whitish; sides of face orange-ochreous. Palpi orange-ochreous. Antennæ ochreous, pectinations blackish. Thorax blackish, bases of patagia whitish. Abdomen blackish, tuft whitish. Legs blackish; anterior pair thickly coated with whitish hairs on external surface; all tarsi orange-ochreous annulated with blackish. Forewings elongate-triangular, costa straight, slightly arched towards apex, apex rounded, termen slightly rounded, oblique; blackish centre of disc thinly scaled; a small whitish discal dot above mid-disc, and a whitish irroration between this and dorsum; basal part of costal edge ochreous; veins interruptedly marked with ochreous; cilia blackish, sharply barred with white. Hindwings with termen rounded; blackish; cilia as forewings.

Allied to *Clathe arida*, Wlk. (*Listoca lignaria*, Wlk., *Sorema unbila*, Wlk., *Perna metastigma*, Wlk.), but readily distinguished by its blackish coloring.

Entometa cycloloma, n. sp.

Male, 40 mm., Head, thorax, and abdomen pale ochreous, intimately mixed with reddish-purple-grey. Palpi three times breadth of eye, purple-grey. Legs purple-grey. Forewings triangular, costa towards base straight, towards apex rather strongly arched, apex rectangular, termen straight, slightly oblique; pale ochreous intimately mixed with reddish-purple-grey; markings fuscous; an outwardly curved faint line from one-fourth costa to one-fourth dorsum; a discal dot at one-third; a second faint line bent inwards in disc, from two-thirds costa to mid-dorsum; a faintly marked oblique row of dots mid-way between this and dorsum; cilia reddish-purple-grey. Hindwings rather narrow and very distinctly elongate, termen prominently rounded; reddish-purple-grey; cilia reddish-purple-grey, on inner margin whitish.

In coloration and general appearance this resembles *E. australasiæ*, Fab. (of which I believe *intemerata*, Wlk., to be a synonym), but the shape of the hindwings is very different. The palpi are also rather shorter.

Cooktown, Queensland; one specimen in Coll. Lyell.

Symphyta, n. g.

Head with projecting cone of scales. Palpi moderate, not longer than twice breadth of eye, clothed with dense hairs, terminal joint concealed. Thorax and abdomen not crested. Mid and hind tibiæ with one pair of minute terminal spurs. Forewings with 2 from near base, 4 and 5 from angle, 6 and 7 stalked, 8 to termen, 9 and 10 stalked. Hindwings with 4 and 5 stalked (rarely 3, 4, 5 stalked), 7 arising near base of cell and anastomosing with 8, several acessory veinlets.

May be distinguished from *Entometa*, Wlk. (*Opsirrhina*, Wlk.) by the shorter palpi, and from *Callia*, Wlk., *Sitina*, Wlk., and *Clathe*, Wlk., by the stalking of veins 4 and 5 of hindwings.

Type *S. psaropis*.

Symphyta psaropis, n. sp.

Male, 38-40 mm.; female, 50 mm. Head, palpi, thorax and abdomen whitish-grey. Antennæ white; pectinations ochreous-whitish. Legs whitish-grey. Forewings triangular, in female elongate-triangular, costa straight to near apex, apex round-pointed, termen straight, in female slightly rounded, oblique; whitish-grey, thinly irrorated with grey; a dark fuscous dot in disc at one-third; cilia white, bases dark fuscous, sometimes apices also barred with dark fuscous. Hindwings with termen strongly bowed; whitish-grey suffused with darker grey, towards inner margin whitish; cilia whitish with a median dark fuscous line.

Townsville, Queensland, in January and February; three specimens received from Mr. F. P. Dodd.

Symphyta nyctopis, n. sp.

Male, 35 mm.; female, 50 mm. Head, palpi, thorax, and abdomen fuscous. Antennæ whitish-ochreous. Legs fuscous. Forewings triangular, costa straight to near apex, apex rounded, termen rounded, oblique; fuscous; a dark fuscous spot in disc at one-third; cilia dark fuscous, apices barred with white. Hindwings with termen rounded; pale fuscous; cilia fuscous, barred with whitish.

Townsville, Queensland, in February and June; two specimens (the male in poor condition) received from Mr. F. P. Dodd, who has found the larvæ on *Eucalyptus platyphylla*.

PYRALIDÆ.

Doddiana, n. g.

Frons flat, not prominent. Tongue present. Antennæ in male minutely ciliated (one-sixth). Maxillary palpi filiform,

closely appressed to labial palpi. Labial palpi porrect; in male 1½ with terminal joint concealed; in female 3 with terminal joint evident, down-curved. Thorax smooth. Forewings with a crest of scales, near base of dorsum and in disc; vein 1 strongly furcate at base, 4 and 5 short-stalked, 6 from cell, 7 stalked with 8, 9 absent (fused with 8), 10 short-stalked with 8. Hindwings with 4 and 5 closely approximated at base, 8 anastomosing with 7.

I dedicate this genus to Mr. F. P. Dodd, who has done so much to increase our knowledge of the moths of Northern Queensland, especially by his keen and patient labors in the discovery and rearing of the larvæ.

Doddiana callizona, Low.

(*Stericta* (?) *callizona*, Lower, Trans. Roy. Soc., S.A., 1896, p. 155.)

Male and female, 25-34 mm. Head purplish; face and palpi dark fuscous. Antennæ ochreous-brown. Thorax purplish, with some whitish scales towards sides. Abdomen purplish-brown; towards apex dark fuscous. Legs dark fuscous; anterior femora and tibiæ purplish; posterior pair mostly ochreous-whitish. Forewings elongate-triangular, costa straight, apex rounded, hindmargin slightly oblique, slightly rounded, with a prominent tuft of scales on inner margin at one-fourth; purplish; a triangular dark green shade on costa from one-sixth to middle, its apex extending to above middle of inner margin; bounded anteriorly by an outwardly curved white suffusion; beyond this costal part of disc is irrorated with white; a narrow irregularly dentate dark fuscous line from costa at four-fifths to before tornus; preceded by a dark fuscous discal dot; succeeded by a fine line, whitish on margins, bluish on upper half, obsolete on lower half; a blackish circular blotch before apex, with a greenish centre; some whitish and greenish scales near termen; cilia purplish, bases whitish, with an interrupted blackish line at one-third. Hindwings, much broader than forewings, hindmargin rounded; grey; towards base paler, and with traces of a pale line at two-thirds; cilia pinkish, with a fuscous line at one-third.

A beautiful and very distinct species.

Townsville, Queensland, a series reared by Mr. F. P. Dodd, in August and September. The larvæ bore the smaller stems of *Timonius rumphii* to the depth of six, nine, or even fifteen, inches, the tunnelled twigs with their affixed masses of silk, woody fragments, and leaves, exactly resemble those tenanted

by many species of *Xyloryctidæ*. When pupating the larva, however, reverts to its pyralid habits, for it quits its tunnel and spins a loose cocoon in the mass at its mouth.

LIMACODIDÆ.

Doratifera stenora, n. sp.

Male and female, 26-30 mm. Head brown; in female suffused with whitish-ochreous; a patch of whitish-ochreous scales beneath roots of antennæ. Palpi brown. Antennæ brown-whitish. Thorax brown; in female with some central reddish-orange hairs. Abdomen brownish with a dorsal reddish-orange line, most developed in female. Legs brown. Forewings elongate-triangular, costa straight, apex round-pointed, termen rounded, strongly oblique; dull fuscous-brown or reddish-brown; an oblique whitish streak from apex towards mid-dorsum, becoming lost in disc; cilia brown. Hindwings with termen rounded; brown; cilia brown.

Rockhampton, Queensland; two specimens in the Queensland Museum.

Doratifera chrysochroa, Feld.

(*Lamprolepis chrysochroa*, Feld., pl. lxxxii., f. 13; *Doratifera euchrysa*, Low., Trans. Roy. Soc., S.A., 1896, p. 152.)

I have received a fine series of this beautiful insect from Mr. F. P. Dodd, who found the larvæ at Townsville feeding gregariously on *Careya australis* and other trees.

Apodecta, n. g.

Face with rounded anterior cone of scales. Palpi stout, rather long (twice breadth of eye), porrect; terminal joint very short. Antennæ of male bipectinated on basal half. Posterior tibiæ with two pairs of well-developed spurs. Forewings with vein 2 from two-thirds, 3 from before angle, 4 from angle, 6 from middle of cell, 7 short-stalked with 8, 9, 10 absent. Hindwings with 3, 4, and 5 remote at base, 6, 7, stalked.

Characterised by the absence of vein 10 of forewings.

Apodecta monodisca, n. sp.

Male, 16 mm. Head, thorax, and abdomen white, tinged with grey. Palpi whitish, with a few dark fuscous scales. Antennæ ochreous-whitish. Legs whitish mixed with dark fuscous. Forewings broadly triangular, costa slightly arched, apex rounded, termen rounded, oblique; grey with a very few scattered dark fuscous scales; a squarish white spot beneath mid-costa, its lower anterior angle connected by a

conspicuous white line with dorsum beyond middle; a dark-fuscous short transverse bar from costa beyond middle, succeeded by a squarish dark-fuscous subcostal blotch, evenly and narrowly margined with white; a faint whitish line from posterior edge of blotch towards tornus; a suffused white line close to termen; cilia grey, bases whitish. Hindwings with termen rounded; pale brownish; cilia whitish-grey, with a white median line.

Townsville, Queensland, in September; one specimen received from Mr. F. P. Dodd.

Birthama plagioscia, n. sp.

Male, 22 mm.; female, 29 mm. Head, palpi, thorax, and abdomen dark brown. Antennæ whitish-ochreous, in female dark fuscous. Legs dark brown. Forewings triangular, costa incurved in male, or straight in female to near apex, apex much rounded, termen long, rounded, strongly oblique; dark brown; an oblique darker shade from near costa at three-fourths to mid-dorsum, well marked in female, nearly obsolete in male; a broad dark shade from costa immediately beyond this line, not extending more than one-third across disc; cilia dark brown. Hindwings with termen rounded; fuscous or dark brown; cilia concolorous.

Brisbane, Queensland; three specimens. Mr. R. Illidge has bred this species.

The genus *Birthama*, Wlk., with vein 7 of forewings separate, and veins 8, 9, 10 stalked, is connected with the following genera (which have 7, 8, 9 stalked) by *Natada*, Wlk., with 8. 9 stalked, 7 and 10 separate. To *Natada* I refer *Doratifera ordinata*, Butl., *colligans*, Luc.

Birthama discotypa, n. sp.

Male, 22 mm. Head, palpi, and thorax brownish-fuscous. Antennæ ochreous-fuscous; male with long double pectinations on basal two-fifths, thence slightly serrate. Legs fuscous. Forewings triangular, costa straight to near apex, apex rounded, termen rounded, slightly oblique; brownish-grey with a few dark fuscous scales; a large circular fuscous brown patch, edged posteriorly with white on dorsum from near base to middle; a similar circular white-edge patch on costa from three-fifths to near apex; cilia grey. Hindwings with termen rounded; dark grey; cilia grey.

Queensland (?), one specimen without locality in the collection of the Agricultural Department.

Susica dochmosema, n. sp.

Female, 40 mm. Head and palpi pale reddish. Thorax brown, in centre reddish. Abdomen brown, legs brownish; tarsi annulated with dark fuscous; anterior tibiæ and middle tibiæ and first joint of tarsi with reddish hairs above. Forewings triangular, costa rather strongly arched, apex rounded, termen rounded, oblique; brown; costal edge reddish; a wavy oblique fuscous line from mid-dorsum to beneath costa at three-fourths; cilia brown. Hindwings with termen rounded; brown-whitish; cilia brown-whitish; apices whitish.

To this genus I also refer *corones*, Feb. (*Miresa humeralis*, Wlk., and *Miresa albibasis*, Wlk.), and *Comana collaris*, Wlk. It is distinguishable from *Miresa*, Wlk. (according to Hampson's "Moths of India") by the male having two pairs of spurs on posterior tibiæ.

Rockhampton, Queensland.

Type in the Queensland Museum.

Susica miltocosma, n. sp.

Female, 48 mm. Head ochreous-grey, margins of face bright red. Palpi bright red. Thorax ochreous-grey more or less rosy-tinged. Abdomen white. Legs whitish, anterior pair brightened above, with black dots on apices of femora and bases of tarsal points. Forewings triangular, costa moderately arched, apex rounded, termen rounded, slightly oblique; ochreous-grey more or less rosy-tinged; costal and terminal margins red; cilia grey, bases ochreous-tinged. Hindwings with termen rounded; white; cilia white.

Male, 33 mm. Antennæ bipectinated to two-thirds. Head and thorax bright red. Forewings bright red, with an oblique outwardly curved fuscous shade from mid-dorsum reaching to mid-disc.

Townsville, Queensland, in December; two female specimens received from Mr. F. P. Dodd. The male is in the Queensland Museum, from Rockhampton. I believe them to be sexes, but regard the female as the type.

Tetraphleps paroa, n. sp.

Female, 36 mm. Head brown, lower edge of face dark fuscous. Palpi dark fuscous. Antennæ fuscous. Thorax dark brown; collar paler. Abdomen reddish-brown. Legs dark fuscous, tarsi annulated with brownish. Forewings triangular, costa rather strongly arched, apex rounded, termen rounded, oblique; fuscous-brown; lines dark fuscous; a short line from dorsum at one-fourth to fold, produced along fold

towards base; a line from mid-costa angulated sharply inwards in disc and again sharply to mid-dorsum, a line from costa at two-thirds with acute projections posteriorly along veins, angulated inwards along vein 2, and then bent to dorsum near tornus; the space between these lines is suffused with reddish-brown, and contains some dark fuscous streaks along veins; a fine terminal line; veins in terminal part of disc marked with darker scales than intervening spaces; cilia brown, with a darker median line. Hindwings with termen rounded; reddish-brown; cilia reddish-brown.

Brisbane, Queensland; one specimen in the collection of the Agricultural Department.

PARASA CORALLINA, n. sp.

Female, 32 mm. Head bright-crimson. Palpi loose-haired; ochreous-brown, beneath dull purple. Antennæ pale brownish, towards base whitish. Thorax bright crimson; patagia dull purple. Abdomen bright crimson; beneath pale fuscous-ochreous. Legs dull purple; middle and posterior tarsi ochreous; posterior tibiæ with a terminal pair of spurs only. Forewings elongate-triangular, costa straight to near apex, apex round-pointed, termen slightly rounded, strongly oblique; deep reddish-purple without markings, in oblique light showing transverse wavy lustrous lines; cilia reddish-purple. Hindwings with termen rounded; veins 6 and 7 stalked; pale reddish-purple, base and inner margin pale ochreous; cilia reddish-purple.

The crimson body renders this a brilliant and unique species. The genus *Parasa*, Wlk., may be distinguished from *Thosea*, Wlk., by the presence of only a single pair of spurs on the posterior tibiæ, and by the pectinations of antennæ in male not being continued to apex.

Townsville, Queensland, in December; one bred specimen received from Mr. F. P. Dodd.

PARASA ATMODES, n. sp.

Male, 30 mm. Head dark fuscous. Palpi clothed with appressed hairs; fuscous, apices ochreous. Antennæ fuscous. Thorax dark fuscous, with leaden-metallic lustre, a V-shaped ochreous line posteriorly, its apex forwards. Abdomen dark fuscous, with leaden-metallic lustre; upper surface of tuft orange-ochreous. Legs dark fuscous annulated with pale ochreous. Forewings triangular, costa straight to near apex, apex round, termen rounded, scarcely oblique; dark fuscous, with leaden-metallic lustre; a whitish spot on base of dorsum;

a fine dentate whitish line from mid-costa to dorsum at one-fourth, preceded by an incomplete blackish line; an interrupted, crenate, whitish line from three-fourths costa to three-fourths dorsum, immediatelwy followed in disc by three blackish spots edged with pale brownish, the upper two confluent; an ochreous-grey terminal band containing a fine crenulate fuscous sub-terminal line; cilia ochreous-grey, apices at tornus blackish. Hindwings with termen rounded; pale fuscous-brown; cilia whitish, apices towards tornus dark fuscous, on inner margin pale brownish.

In the type one of the forewings has thirteen veins, vein 4 being forked from near base. On the other side the neuration is normal.

Townsville, Queensland, in March; one specimen received from Mr. F. P. Dodd.

PARASA LOZOGRAMMA, n. sp.

Male, 30 mm. Head, palpi, thorax, and abdomen ochreous-whitish. Legs ochreous-whitish; anterior coxæ and femora fuscous. Forewings triangular, costa straight to apex, apex tolerably pointed, termen slightly rounded, slightly oblique; ochreous-whitish, somewhat brownish tinged; a very oblique brownish-fuscous line from costa near apex to dorsum at one-fifth; an inwardly curved line from a point with the preceding on costa to termen above tornus; cilia ochreous-whitish, apices towards tornus fuscous. Hindwings with termen rounded; ochreous-whitish; cilia ochreous-whitish.

In markings this is similar to *Thosea divergens*, Moore, though not identical.

Brisbane, Queensland, in January; one specimen.

CRYPTOPHASA EUCEPHALA, n. sp.

Male and female, 29-38 mm. Head ochreous-yellow; face white or whitish. Palpi white; basal two-thirds of second joint with an anterior ochreous line; distal third of second joint and terminal joint with an anterior dark fuscous line. Antennæ white; in male shortly pectinate (1). Thorax snow white. Abdomen grey; first two segments mixed with reddish-ochreous; sides white; lower surface ochreous with a pair of blackish dots on each segment. Legs ochreous-yellow annulated with blackish. Forewings narrow-elongate, costa slightly arched, apex rounded, hindmargin slightly oblique, slightly rounded; snow white; costal edge ochreous, at extreme base blackish; cilia snow-white. Hindwings grey; towards inner-margin whitish; cilia snow-white.

Townsville, Queensland, in October; a series bred by Mr. F. P. Dodd from larvæ which tunnel the smaller stems of *Grevillea striata*, and probably other proteaceous shrubs. On pupating the enrance is completely blocked by a white plug.

Type in Coll. Walsingham.

XYLORYCTA RHIZOPHAGA, n. sp.

Male and female, 25-33 mm. Head and thorax white. Palpi white, anteriorly suffused with fuscous. Antennæ white, in male laminate, laminations two-thirds, ending in tufts of cilia. Abdomen grey-whitish; two basal segments irrorated with orange scales. Legs whitish; anterior and middle pairs fuscous anteriorly. Forewings narrow-oblong, costa gently arched, apex obtuse; hindmargin straight, rounded beneath, scarcely oblique; snow white; costal edge fuscous towards base; cilia snow white. Hindwings 1½; hindmargin rounded; grey; towards base whitish; cilia white.

Easily distinguished from *X. homoleuca*, Low., which has all the wings narrower, hindmargin of forewings oblique, hindwings whitish, and male antennæ not laminate.

Townsville, Queensland, in November and December; a series bred by Mr. F. P. Dodd.

The larva feeds on *Persoonia falcata*. It forms a spout-like chamber of silk and fragments of bark just on or an inch or two above the surface of the ground, and tunnels the stem for from 6 to 10 inches, the tunnel being nearly wholly underground, and sometimes extending into a root. If the stem is accidentally broken it spins a chimney to the surface of the ground. When about to pupate it shuts off the upper part of the chamber, and forms a new short spout, through which it emerges. The pupa is placed at the bottom of the long tunnel, the moth leaves the pupal shell there, and creeps up the tunnel to the surface.

Type in Coll. Walsingham.

XYLORYCTA BASILEIA, n. sp.

Male and female, 17-19 mm. Head, purple-fuscous; lower part of face yellow. Palpi purple-fuscous; lower part of second joint yellow anteriorly. Antennæ dark fuscous; ciliations in male very short (one-fifth). Thorax golden-yellow. Abdomen ochreous-fuscous; tuft ochreous. Legs yellowish; anterior and middle pairs fuscous anteriorly. Forewings elongate-oblong; costa arched, in male more strongly; apex round-pointed; hindmargin oblique, rounded beneath; deep shining purple; extreme base and a median band golden-yellow;

median band transverse, biconcave; cilia fuscous. Hindwings scarcely broader than forewings; hindmargin sinuous; grey, towards base ochreous-tinged; cilia pale ochreous, with a suffused greyish median line.

Allied to *X. lætiorella*, Wlk., but readily distinguished by the wholly dark cilia of forewings.

Townsville, Queensland, in October; a series bred by Mr. F. P. Dodd.

Type in Coll. Walsingham.

Brachybelistis, n. g.

Head with appressed scales. Palpi slender, recurved, short, not reaching base of antennæ; terminal joint minute, pointed. Maxillary palpi minute. Tongue obsolete. Antennæ in male simple, moderately ciliated. Thorax not crested. Forewings with vein 2 from three-fourths to five-sixths, 7 and 8 stalked, 7 to termen. Hindwings with 3 and 4 stalked, 6 and 7 connate or stalked.

Differs from *Xylorycta*, Meyr., in the very short palpi, with minute terminal joint. It is certainly a good genus, the known species being closely related and having a peculiar facies.

Brachybelistis neomorpha, Turn.

(*Xylorycta neomorpha*, Turn., Annals Queensland Mus., iv., 13, 1897.)

The hindwings differ in the two sexes. In the male they are dark fuscous, with ochreous-whitish cilia, in the female both hindwings and cilia are grey. The anterior and middle tibiæ and tarsi and posterior tarsi are crimson in the male, pale crimson in the female.

Cryptophaga blackburnii, Low. Tr. Roy. Soc., S.A., 1892, p. 15, appears to be a closely allied species.

Brachybelistis pentachroa, Low.

(*Xylorycta pentachroa*, Low. Trans. Roy. Soc., S.A., 1901, p. 83.)

Male, 21 mm. Head and antennæ blackish; antennal ciliations moderate (1½). Palpi ochreous. Thorax blackish. patagia ochreous. Abdomen blackish, dorsum of third segment ochreous. Legs ochreous, femœa dark fuscous. Forewings elongate, costa very slightly arched, apex round-pointed, termen nearly straight, oblique; ochreous-yellow; a blackish discal dot before middle, confluent with a large blackish blotch, which occupies whole posterior half of wing except costal and

terminal margins; cilia ochreous-yellow. Hindwings rather elongate, termen slightly rounded; pale ochreous yellow; a broad blackish terminal band; cilia pale ochreous-yellow, near tornus blackish.

Female, 30-37 mm. Head whitish, pinkish-tinged. Palpi ochreous. Antennæ whitish. Thorax whitish, pinkish-tinged; two elongate posterior dark grey spots. Abdomen grey; third segment ochreous; apices of segments pale ochreous. Legs ochreous. Forewings elongate, costa moderately arched, apex round-pointed, termen nearly straight, oblique; whitish, pinkish-tinged; with four oval ochreous spots, bordered with blackish scales and surrounded with more or less blackish irroration; first spot in disc at one-third, second obliquely beyond and below first, third and fourth closely approximated, arranged transversely in disc before two-thirds, the latter more elongate; cilia pale grey, apices ochreous-fuscous. Hindwings pale yellowish; a suffused pale grey terminal band; cilia pale grey.

No one would have considered these dissimilar insects to be sexes, but Mr. Dodd, who has bred a series, and in whom I have every confidence, assures me that that is the case. I think this must be identical with the species described by Mr. Lower, although if so he has described a female type as the male.

Townsville, Queensland, in December; three specimens received from Mr. F. P. Dodd.

Lichenaula candescens, Low.

(*Xylorycta candescens*, Lower. Tr. R.S., S.A., 1896, p. 163; *Lichenaula dissimilis*, Turner. Annals Queensland Mus., 1897, iv., p. 18.)

Charters Towers, Townsville, and Brisbane, Queensland.

Lichenaula comparella, Wlk.

(*Œcophora comparella*, Wlk., Tin., 681; *Lichenaula callisema*, Turn., Annals Queensland Mus., iv., p. 19.)

I have examined and identified Walker's type in the British Museum.

I may here remark that the large genera, *Xylorycta* and *Lichenaula*, are in an unsatisfactory position at present, and will need revision. The stalking or separation of veins 6 and 7 of the hindwings is certainly variable in several species.

Lichenaula allocrossa, n. sp.

Male and female, 22-25 mm. Head and palpi clear brown. Antennæ fuscous; in male slightly serrate, with short ciliations

(½). Thorax whitish-grey; anteriorly dark brown. Abdomen grey, mixed with brown on dorsum, tuft of male whitish. Legs fuscous; posterior femora and tibiæ ochreous-whitish. Forewings elongate-oblong, costa slightly arched, apex rectangular, hindmargin straight, not oblique; grey-whitish mixed with dark fuscous scales, which tend to form streaks on veins; an obscure longitudinally elongate brown spot at end of cell; hindmargin clear brown except at anal angle; cilia narrowly white at bases, then broadly brown-fuscous, then pale fuscous mixed with whitish, at anal angle wholly grey-whitish. Hindwings somewhat broader than forewings, hindmargin rounded; ochreous-fuscous-whitish; cilia whitish with a grey line at one-third.

Mount Elliott, near Townsville, Queensland, in September; a series bred by Mr. F. P. Dodd.

Type in Coll. Walsingham.

PLECTOPHILA DISCALIS, Wlk.

(*Acontia discalis*, Wlk., suppl. 786; *Pletophila discalis*, Meyr., Tr. R.S., S.A., 1890, 55; *Lichenaula inscripta*, Turn., Annals Queensland Mus., iv., 21, Trans. Roy. Soc., S.A., 1900, p. 9.)

LICHENAULA CASTANEA, n. sp.

Female, 17 mm. Head white. Palpi long, terminal joint as long as second; whitish, apical portion of terminal joint fuscous. Antennæ fuscous, basal joint white. Thorax whitish (rubbed). Abdomen reddish-ochreous-fuscous, apices of segments and tuft whitish-grey; beneath dark fuscous, irrorated with whitish. Legs whitish. Forewings elongate-oblong, costa moderately arched, apex rounded, hindmargin but little oblique, rounded beneath; whitish irrorated with reddish-brown and purple-brown scales forming very confused markings; the purple-brown scales predominate along inner margin, the reddish-brown tend to form four suffused nearly equi-distant transverse fasciæ. Of these, the last, which is hindmarginal, is the best marked; cilia white, mixed with bright reddish-brown. Hindwings grey; cilia ochreous-whitish, with a fuscous line at one-third, towards anal angle grey.

Not very near any other species.

Birchup, Victoria; one specimen in November.

Type in Coll. Lyell.

Leptobelistis, n. g.

Head with loosely appressed hairs. Tongue very small and weak. Antennæ in male strongly ciliated. Palpi short, recurved, slender, not reaching vertex; second joint with appressed scales; terminal joint about half second, slender, acute. Thorax smooth. Abdomen slender. Forewings with vein 2 from five-sixths, 3 from angle, 7 and 8 long-stalked, 7 to hindmargin. Hindwings with 3 and 4 separate at base, 6 and 7 stalked to four-fifths of their length.

The long-stalking of veins 6 and 7 of the hindwings and the short palpi, with well-developed, slender, terminal joint, sufficiently characterise this genus.

Leptobelistis asemanta, n. sp.

Male and female, 12-15 mm. Head white. Palpi white; second joint with a subapical fuscous ring. Antennæ dark fuscous; in female white; ciliations in male 2. Thorax dark fuscous, irrorated with white. Abdomen ochreous-fuscous; tuft whitish. Legs white; anterior and middle pair dark fuscous anteriorly. Forewings rather narrow, costa slightly arched, apex round-pointed, hindmargin straight, oblique; white, sparsely irrorated with dark fuscous; three large fuscous spots on inner margin at base, middle, and anal angle; cilia dark-fuscous mixed with white. Hindwings and cilia pale grey.

Townsville, Queensland, in November; a series bred by Mr. F. P. Dodd.

Type in Coll. Walsingham.

Clerarcha poliochyta, n. sp.

Male and female, 20-28 mm. Head, palpi, and thorax white, very sparsely irrorated with dark fuscous. Abdomen grey. Legs white, irrorated, and tarsi annulated with dark fuscous. Forewings elongate-oblong, costa slightly arched at base, thence nearly straight to near apex, apex round-pointed, termen obliquely rounded; pale grey, mixed with white and dark fuscous; a short narrow vertical dark fuscous line from fold in disc at one-third; a dark fuscous discal dot surrounded by white at two-thirds; a sub-terminal series of dark fuscous streaks on veins; a series of minute terminal dark fuscous dots obsolete towards costa; cilia grey, bases and extreme apices white. Hindwings elongate-ovate, termen slightly sinuate; grey; cilia whitish with a grey line at one-third.

Townsville, Queensland, in September; four bred specimens received from Mr. F. P. Dodd.

Type in Coll. Walsingham.

Illidgea æthalodes, n. sp.

Male and female, 22-26 mm. Head, thorax, and palpi dark grey mixed with whitish. Antennæ dark fuscous. Abdomen whitish-grey or grey. Legs white,irrorated and annulated with dark fuscous; posterior pair mostly white. Forewings broad, oblong, costa rather strongly arched at base, thence straight, apex rectangular, hindmargin straight, slightly sinuate, not oblique, rounded beneath, inner margin strongly curved at base; dark grey mixed with whitish, markings black; a strong line from base of costa along basal part of inner margin; a fine transverse streak from costa before middle, not reaching inner margin; this is preceded by two shorter streaks from costa, which are connected in disc with each other and with basal line; an inwardly oblique streak from costa at three-fourths, rather broad on costa, narrowing, and reaching to little beyond middle of disc; a fine erect streak, succeeded by a white shade, from before anal angle, bent slightly outwards in disc, so that it passes well posteriorly to costal streak; some fine blackish lines on posterior veins; a fine blackish hindmarginal line; cilia dark grey mixed with whitish. Hindwings as broad as forewings, hindmargin rounded; grey; in male whitish towards base, in female wholly grey; cilia grey-whitish with a darker line at one-third.

Unlike *I. epigramma*, Meyr., this species appears to be very constant in its markings. From the former species it is best distinguished by the posterior line being broken into two separate streaks.

Townsville, Queensland, in September and October; a series bred by Mr. F. P. Dodd.

Types in Coll. Walsingham.

Uzucha hypoxantha, Low.

(*Uzucha hypoxantha*, Low., Trans. Roy. Soc., S.A., 1894, p. 88. *Gonioma xanthopsis*, Turn., Annals Queensland Mus., iv., p. 28, 1897.)

Veins 6 and 7 of hindwings may be either approximated at base, connate, or short-stalked; vein 7 of forewings either to apex or slightly to the costal side of apex. My genus, *Gonioma*, must, therefore, be quashed.

This species varies in size from 23 to 42 mm.

Procometis stenarga, n. sp.

Male and female, 22-25 mm. Head, thorax, palpi, and antennæ blackish, irrorated with white. Abdomen ochreous-fuscous; in female grey; apices of segments and tuft in male

pale ochreous. Legs white mixed with dark fuscous; posterior pair whitish-ochreous. Forewings elongate, costa moderately arched, apex rounded, hindmargin obliquely rounded; white irrorated with blackish; middle of costa narrowly clear white; two indistinct darker spots in disc at and below middle in posterior part of disc a tendency to longitudinal parallel to veins; cilia dark fuscous, mixed with white. Hindwings ochreous-fuscous; towards base paler, towards apex fuscous; cilia ochreous-fuscous with a darker basal line; in female hindwings and cilia are grey.

Near *P. genialis*, Meyr., which has brighter hindwings and a brownish spot on forewings.

Gisborne, Victoria, in February; two specimens taken by Mr. S. Lyell.

PROCOMETIS DIPLOCENTRA, Meyr.

In Annals Queensland Museum, iv., p. 29, I threw some doubt on the occurrence of this species in Queensland. Since then I have seen specimens from Duaringa which answer to the description with exactness. I am now satisfied that the specimen attributed to it from Tasmania, though closely similar, is not identical.

AGRIOPHARA HORRIDULA, Meyr.

(Trans. Roy. Soc., S.A., 1890, p. 77. *Agriophara leucanthes*, Turn., Annals Queensland Mus., iv., p. 31, 1897.)

I have compared my type with Mr. Meyrick's.

ZYGÆNIDÆ.

MONOSCHALIS MIMETICA, n. sp.

Male and female, 20-27 mm. Head orange. Fillet and antennæ blackish, with a purple lustre. Thorax blackish, with a large orange posterior spot. Abdomen blackish, with five broad orange annulations; basal and apical segments blackish. Legs blackish. Forewings elongate-triangular, costa gently arched, apex round-pointed, termen very oblique, gently rounded; blackish, with pale orange spots; a longitudinal streak in mid-disc near base; an approximately triangular spot below costa beyond middle, succeeded beneath by an oval spot indented posteriorly, and that by a small roundish spot above tornus; a subapical spot indented posteriorly once or twice, sometimes partly divided by fine blackish lines on veins; cilia blackish. Hindwings short, triangular, costa abruptly arched, termen gently rounded; blackish; a large basal pale orange spot divided by a fine blackish line on median vein;

and less distinctly on internal veins; a second roundish spot beneath middle of costa; cilia blackish.

This species closely resembles *Thyrassia subcordata*, Wlk., from India, but vein 10 of forewings is free. Both genera will be found characterised in Hampson's "Moth of India," vol. i., p. 238. Possibly they may eventually be amalgamated. In the present species veins 8 and 9 of forewings are variable, being either separate or short-stalked.

Not only is the shape, pattern, and coloration of the fore and hind wings that of a *Syntomid*, but the neuration of the hindwings is very deceptive at first sight. The distal part of vein 8 is wanting, but the proximal part (costal vein) is well marked. The subcostal vein is weak, and may be overlooked, so that at first it may appear that the costal vein is altogether wanting. More careful examination shows that the resemblance to the neuration of the *Syntomidæ* is merely superficial and misleading.

Townsville, Queensland, in January, February, and March; a series received from Mr. F. P. Dodd, who informs me that the larvæ are short and thick, whitish, with weak hairs, and feed on a species of *Vitis*.

ZEUZERIDÆ.

Xyleutes nephocosma, n. sp.

Male, 50 mm.; female, 62 mm. Head grey; face whitish-grey. Antennæ pale ochreous; in female whitish. Thorax grey; in male with two longitudinally black lines diverging posteriorly and some blackish scales on posterior margin. Abdomen whitish-grey in male; grey in female. Forewings narrow-elongate, costa slightly arched, more strongly in female, apex round-pointed, hindmargin very oblique, rounded beneath; whitish-grey; mottled and blotched with darker grey, which forms three squarish blotches near base, beneath costa at two-fifths, and above inner-margin beyond middle; and an elongate shade before and parallel to upper half of hind margin; a series of dark fuscous dots on costa; a series of short transverse dark fuscous strigulæ from inner-margin, sometimes united by a fine irregular longitudinal line; cilia whitish, barred with fuscous on veins. Hindwings elongate, hindmargin scarcely rounded, sinuate before anal angle; whitish; in female grey; cilia as forewings.

In my male type there is a bar between veins 7 and 8 of hindwings beyond cell (not opposite the cell as in *Zeuzera*). This is absent in the female.

Townsville, Queensland, in November and December; two specimens received from Mr. F. P. Dodd, who bred them from larvæ found in stems of *Melaleuca leucodendron*. He informs me that the specimens are rather small examples.

Xyleutes zophoplecta, n. sp.

Male, 42 mm. Head, thorax, and antennæ dark fuscous. Abdomen dark grey. Forewing narrow-elongate, costa slightly arched, apex rounded, hindmargin very obliquely rounded; dark grey; apical half suffused towards costa with whitish-grey; the whole disc closely strigulated with black. strigulæ coarse towards base, very fine over suffused area; a few whitish-grey scales along lower part of hindmargin; cilia fuscous with a few whitish-scales. Hindwings and cilia dark grey.

Townsville, Queensland, in December; one specimen received from Mr. F. P. Dodd.

TRYPANIDÆ.

Dudgeona actinias, n. sp.

Male and female, 31-43 mm. Head and thorax dark reddish-brown; apices of tegulæ ochreous; thorax with a large bifid posterior crest. Abdomen whitish-ochreous. Legs whitish-ochreous; anterior and middle tibiæ mostly dark reddish-brown. Forewings elongate-oblong, posteriorly dilated, costa slightly arched, apex rounded, hindmargin scarcely oblique, rounded beneath; dark reddish-brown; towards costa, hindmargin, and base of inner-margin paler and interrupted by numerous small ochreous spots; a cluster of five to nine shining snow white rounded spots on inner-marginal part of basal third of disc; a series of four or five similar spots of unequal sizes along hindmargin; preceded by three or four similar spots in central part of hindmarginal area; cilia dark reddish-brown. Hindwings elongate-ovate, hindmargin slightly rounded; pale ochreous, partly suffused with brownish; cilia whitish-ochreous.

This magnificent species appears to agree in structural characters with Hampson's genus *Dudgeona*, of which I was able to examine the type, an Indian species, in the British Museum. It certainly suggests a relationship to the *Tortricina*.

Townsville, Queensland, in December; several specimens received from Mr. F. P. Dodd, who states that the larvæ have the habits of *Xyleutes*. Like that genus, the pupa has to break through a thin covering of bark, and then protrudes while the moth emerges.

XYLORYCTIDÆ.

Pilostibes embroneta, n. sp.

Male and female, 30-46 mm. Head brown-whitish; face white. Palpi white; external surface of second joint brownish. Antennæ white; pectinations in male 1. Thorax pale brown. Abdomen whitish, mixed with reddish-brown. Legs brown-whitish. Forewings elongate-oblong, costa strongly arched, apex acute, hindmargin oblique, sinuate beneath apex; pale brown, with a very few scattered dark fuscous scales; a broad streak from base of costa to beyond middle of disc, toothed above at one-third and beneath at two-thirds, white, edged with dark fuscous, apical third narrow and wholly dark fuscous; cilia grey, with a strongly marked dark fuscous basal line. Hindwings 1½, hindmargin rounded; whitish, slightly brownish-tinged; cilia whitish.

Mareeba, Northern Queensland; two imagos bred in August from larvæ feeding in the stems of a crimson-flowered *Callistemon* growing on the banks of the Barron River.

Cryptophasa psilocrossa, n. sp.

Male, 35 mm. Head whitish-brown; face whitish. Palpi whitish. Antennæ dark fuscous; pectinations 1. Thorax ochreous-brown, with a posterior pale ochreous spot. Abdomen dark fuscous; second segment orange-ochreous; tuft whitish-ochreous. Legs whitish-brown annulated with dark fuscous; posterior pair mostly dark fuscous. Forewings somewhat dilated near base; costa slightly arched, apex round-pointed, hindmargin obliquely rounded; ochreous brown; with five blackish dots in disc; first in disc beyond one-third; second in disc at two-thirds; third before and beneath second; fourth and fifth close together, above and beneath fold, equi-distant from first and third; an interrupted blackish line on lower two-thirds of hindmargin; cilia ochreous-brown. Hindwings much broader than forewings, hindmargin rounded; dark fuscous; a narrow strip denuded of scales from apex along apical half of hindmargin; cilia white.

In general appearance resembles the male of *C. balteata*, Wlk., but the wings are broader and differently shaped. It also differs in the pale spot on thorax, absence of dots on costa of forewings; and partly bare margin and white cilia of hindwings. The female is not yet known.

Brisbane, in October; one specimen bred from *Eucalyptus*.

Cryptophasa hyalinopa, Low.

(Trans. Roy. Soc., S.A., 1901, p. 82.)

Male, 31-32 mm. Head and palpi whitish. Antennæ blackish, pectinations 1. Thorax pale pinkish-white. Abdomen blackish; apices of segments whitish; second segment reddish-orange. Legs whitish, anterior pair pinkish, annulated with blackish. Forewings rather narrow, costa nearly straight, apex round-pointed, hindmargin very obliquely rounded; slaty-brown; with five black discal dots; first at one-third of disc and one-third from costa; second before two-thirds of disc and one-third from costa; third before and below second; fourth and fifth closely approximated, above and below fold, about midway from first and third; cilia pale fuscous, with a dark fuscous basal line. Hindwings 1½; hindmargin slightly rounded; blackish; apical two-fifths free from scales and transparent; the line of division sharp, somewhat dentate; cilia white.

Female differs as follows: 65-70 mm. Antennæ white, finely annulated with dark fuscous. Forewings broader, costa moderately arched, hindmargin less oblique; pinkish; cilia with a series of blackish basal dots. Hindwings white, with an inner-marginal hairy patch. Abdomen with apical segments whitish.

Townsville, Queensland, in October; bred abundantly from *Eucalyptus sp.* by Mr. F. P. Dodd.

Cryptophasa sacerdos, Wlsm., M.S.

Male, 37 mm. Head pale reddish-orange. Palpi white, terminal joint dark fuscous. Antennæ black, pectinations 2, 3. Thorax white, anteriorly faintly suffused with reddish-orange. Abdomen dark fuscous. Legs blackish, with white annulations. Forewings oblong, costa slightly arched at base, thence nearly straight, apex obtuse, hindmargin slightly oblique, rounded; blackish-fuscous, without markings; cilia white, basal one-fourth dark fuscous. Hindwings dark fuscous; cilia fuscous.

Female differs as follows: 50-54 mm. Abdomen dark fuscous, with white annulations, terminal segment white. Forewings clear white, base sometimes suffused with fuscous; a black dot in disc at three-fifths; a row of black dots along apical third of costa and hindmargin; cilia white. Hindwings fuscous; along costa white; some obscure blackish dots on hindmargin; cilia white, towards anal angle greyish.

The sexes are very different.

Brisbane, larvæ tunnelling the stems of *Eucalyptus* (Blood-wood).

Types in Coll. Walsingham.

Cryptophasa eugeniæ, Luc.

(Proc. Roy. Soc., Queensland, 1899, p. 153.)

In the "Annals of the Queensland Museum," No. iv., p. 10 (1897) I wrongly identified this species with *C. pultenaeæ*, Lewin, but now recognise its distinctness. It is closely allied to *C. epadelpha*, Meyr., which, however, always lacks the discal dots on the forewing.

Cryptophasa byssinopis, n. sp.

Male and female, 42-45 mm. Head, thorax, and palpi white. Antennæ in male white; pectinations 4-5; in female dark grey, towards base white. Abdomen white; second segment bright reddish-ochreous above. Legs white; tarsi annulated with blackish; anterior tibiæ blackish anteriorly. Forewings elongate-oblong, costa moderately arched, apex rounded, hind-margin obliquely rounded; vein 2 from near middle of cell; snow white; with three blackish discal dots, first in disc at one-third, second in disc beyond middle, third beneath and posterior to second; a series of minute blackish dots on hind-margin; cilia white. Hindwings white, with minute hind-marginal blackish dots sometimes obsolete; cilia white.

The sexes are closely similar. Nearly allied to *C. eugeniæ*, Luc., from which the male is readily distinguished by the white hindwings; the female is closely similar to that of *eugeniæ*, but the black dots on margin of wings, especially hindwings, are less developed, and sometimes obsolete.

Townsville, Queensland, in September; a series bred by Mr. F. P. Dodd.

Types in Coll. Walsingham.

Cryptophasa panleuca, Low.

(Trans. Roy. Soc., S.A., 1901, p. 83.)

Male and female, 31-44 mm. Head, thorax, and palpi white. Antennæ white in both sexes; pectinations in male 1½. Abdomen white; second segment bright reddish-ochreous above; apices of three succeeding segments narrowly reddish-ochreous above. Legs white; inner aspect of anterior pair spotted with blackish. Forewings elongate-oblong, costa slightly arched, apex rounded, hindmargin obliquely rounded; white; cilia white. Hindwings white; a series of minute blackish dots along hindmargin.

The sexes are closely similar. This species may be at once distinguished from the preceding by the absence of discal dots.

Townsville, Queensland, in September; a series bred by Mr. F. P. Dodd. The larvæ bore the stems of species of *Tristania*.

Thosea penthima, n. sp.

Male, 28 mm. Head, palpi, thorax, and abdomen dull brown. Antennæ whitish, pectinations ochreous-whitish, in male pectinated to apex. Legs dull brown; posterior tibiæ with two pairs of spurs. Forewings triangular, costa straight to near apex, apex obtusely rectangular, termen strongly bowed, slightly oblique; whitish-grey, suffused with brownish, with a few scattered dark fuscous scales, absence of brownish suffusion leaves a pale oblique fascia, its anterior edge much suffused, its posterior edge sharply defined by a fuscous line from costa at five-sixths to dorsum at two-thirds; a minute dark fuscous discal dot in fascia; a pale terminal band from absence of brownish suffusion; cilia brownish-fuscous. Hindwings with termen rounded; veins 6 and 7 stalked; pale brownish; cilia as forewings.

Townsville, Queensland, in April; one specimen received from Mr. F. P. Dodd, who informs me that the larvæ are oval and very broad, covered with numerous tufts of stinging spines, and feed on *Careya australis*.

Elassoptila, n. g.

Head with rounded anterior cone of scales. Palpi very long, porrect, second joint five times breadth of eye, with projecting scales at apex, terminal joint about one-fourth second, obliquely ascending, stout, tolerably acute. Tongue absent. Antennæ in male with long coarse double pectinations continued almost to apex; in female filiform. Posterior tibiæ with two pairs of long spurs. Forewings with 2 from five-sixths, 4 from angle, 5 from shortly above angle, 6 from near middle of cell, 7, 8, 9 stalked. Hindwings with 3 and 4 connate, 5 parallel to 4, 6, and 7 long-stalked.

The peculiar palpi are sufficient to distinguish this genus.

Elassoptila microxutha, n. sp.

Male, 14-16 mm. Head and thorax brown. Palpi brown, apex and internal surface ochreous-whitish. Antennæ dark fuscous. Abdomen fuscous mixed, except at apex, with orange-ochreous. Legs fuscous annulated with ochreous whitish. Forewings triangular, costa strongly arched, apex rounded, termen rounded, oblique; brown; an obscure fus-

cous erect mark from dorsum before middle; a straight oblique whitish line from costa at two-thirds towards tornus, its lower extremity attenuated and only represented by minute dots on veins; cilia dark brown. Hindwings with termen rounded; fuscous-brown, an elongate orange-ochreous spot in dorsal part of mid-disc; cilia fuscous-brown.

Female, 20 mm. Forewings more elongate. Abdomen wholly ochreous. Color and markings of wings less distinct.

This species has rather the *facies* of a small *Lymantriad*.

Mount Tambourine, Queensland, in December, February, and March. The male found plentifully flying in a rapid zig-zag course within the dense forest a few inches from the ground. I took only one female.

Aboriginal Rock Paintings on the South Para, Barossa Ranges.

By E. C. Stirling, M.D., F.R.S.

Plates III. and IV.

[Read August 5, 1902.]

Like the Australian aborigines themselves, their handiwork, that cannot receive the protecting shelter of a museum, must in the nature of things disappear, and thus it seems desirable to lose no opportunity of preserving a pictorial record of such perishable objects as their rock paintings. With this view, I submit to the notice of the Society a record of a few such drawings found in two rock shelters, on the Yatalunga estate, in the hills to the north-east of Adelaide. Aboriginal drawings of the same general character as those to be mentioned have been described and figured from various localities in South Australia. The Horn Expedition met with several series in the MacDonnell Ranges and their outliers, many of which are reproduced in its report (1); others appear in the report of the Elder Expedition (2); and Mr. Worsnop's book (3) contains a number of them, derived from various sources. A good account of these paintings, with many figures, is contained in the recent comprehensive book of Messrs. Spencer and Gillen (4). Similar drawings from various parts of Australia have been recorded in the scientific publications of the other States, and the journals and reports of many explorers and travellers have frequently contained allusions to their existence.

So far as I am aware, however, the drawings now to be noticed are the only ones that have been reported from the near neighbourhood of Adelaide, though the adjacent ranges supply many shelters or protected rock surfaces such as commend themselves to the natives for their artistic purposes. The Yatalunga drawings must have been known to the early

(1) Report on the work of the Horn Scientific Exploring Expedition, Part IV., Anthropology, 1896.
(2) Trans. Royal Soc., S.A., vol. iv., p. 237.
(3) Prehistoric Arts, Manufactures, Works, Weapons, &c., of the Aborigines of Australia, Adelaide, 1897.
(4) Native Tribes of Central Australia, 1899.

settlers in these parts, for the ruins of a long-habited dwelling-house stand within a few hundred yards of their position, which is easily visible and accessible. But if observed they seem to have been forgotten, for those who, more recently, have lived many years in the locality—even the owners of Yatalunga—had no knowledge of their existence till they were recently brought to notice by Mr. Percy Ifould. This gentleman, in company with two fellow-students of the School of Mines, quite recently discovered the larger of the two shelters in the course of a geological excursion. On a second visit the smaller shelter was noticed by Mr. W. Brooks, of Smithfield.

The shelters are situated about two miles to the north-east of Yatalunga House in a valley in the Barossa Ranges on the right bank of the South Para, close to a sharp bend in the stream. Here the hillside rises steeply from within a few yards of the river bank; a little lower down, the hill-slope springs from the bank itself.

My colleague, Mr. Howchin, informs me that the material of the rock, the unequal weathering of which has produced the shelters, varies from a clay slate (phyllite) to a fine-grained schistose rock. This decomposes to a fine impalpable powder making good soil, as evidenced by the abundant growth of grass which it supports

There are two shelters in which paintings exist. The larger (Plate iii.) is a recess a few yards from, and a few feet above, the normal river bank, and is stated to be beyond the level of the highest flood. This shelter is 15 feet in length, 6 feet high at its mouth, and about the same in depth. On the rather uneven dark surface of the back wall are the drawings numbered 1—9 (Plate iv.). They are all done in red ochre, margined with a narrow band of white material. All but one of these are zoomorphic in character, representing animal objects. Of these fig. 1 is clearly a snake, possibly (from its shape) a death adder, and a lively imagination might conceive it as represented in the act of striking. Fig. 2, from the shape of the head and the "turn up" of the toes, is apparently the figure of a man. I interpret fig. 3 as that of a dog which, notwithstanding its general crudeness, distinctly conveys the idea of active motion. Figs. 4 and 5—the latter indistinct—represent bird tracks, probably those of the emu. Fig. 6 may perhaps be intended for a sleeping lizard, though the limbs are disproportionately long for this animal. For fig. 7 I have no suggestion to offer, unless it be a design for a corrobboree decoration pattern or be one of a class of paintings that will be

noticed in connection with those in the second shelter. Figs. 8 and 9 are clearly intended for birds of different kinds. In the former the even lower contour makes it appear as if the artist had intended to picture the bird as resting upon the water; but the appearance is really due to the cutting off of the lower part of the design by obliteration. There were also pigmentary indications of other drawings in this shelter, but they had become so greatly obliterated as to be indecipherable; and they have, therefore, been omitted from the plate. In the upper part of the back wall some drawings had evidently become obscured by numerous mud nests of wasps and swallows.

About 150 yards lower down the stream, and at a rather higher level above the river, is a considerably smaller shelter, which also contains a few discernible drawings. In this a considerable recent fall of earth from above has partly blocked the entrance, and probably also raised the level of the floor, for it is now impossible to stand upright in the shelter. Moreover, the raising of the floor has brought it within a few inches of the lowest drawings. To have drawn the designs in the position which these now occupy would have almost required the artist to have assumed the prone position.

The drawings in this cave (nos. 10-13), which are shown in the inset in Plate iv., are also done in red ochre; but in these there is no marginal white. Fig. 12 again repeats a bird track, and possibly 13 may also be zoomorphic in origin, but the reproduction, which has unintentionally made the figure rather more symmetrical than the reality, evokes unduly this suggestion.

Figs. 10 and 11 may possibly belong to the class of designs described by Messrs. Spencer and Gillen (1), called *Churinga Ilkinia* by the Arunta, which are regarded as sacred from their association with totems. The former appears like a simple form of two figures represented on plate 131 of the work just referred to. Their meaning was unknown to the writers beyond the fact that they were connected with the honey-ant totem of the Warramunga tribe in the neighbourhood of Barrow Creek. In these the vertical stripe bisects three series of concentric circles.

On digging into the floor of both caves indications were found of former occupancy in the shape of pieces of charred wood, a few fragments of fresh water mussel shells, and a fragment of the jaw of a small rodent animal. On the surface of

(1) Native Tribes of Central Australia, p. 614, &c.

the floor, as well as almost everywhere else around, were the recent remains of dead rabbits.

I have been able to gather no information as to the age of these drawings, or as to the tribe by whom they were executed. The unobliterated figures are, however, still quite distinct. In general style and characters and the colors used the zoomorphic designs are quite similar to those that have been recorded from other parts, the bird tracks being especially of frequent occurrence, but there were no indications here of the stencilled figures of hands that have been so often noticed in many such shelters throughout the country.

In conclusion, I have to thank Mr. John Hogarth for the photograph from which Plate iii. is reproduced; Mr. Tucker for other photographs, which it has not been possible to utilise; and Miss Harwood for reproducing, from my own crude sketches, some of the drawings of Plate iv.

DESCRIPTIONS OF NEW GENERA AND SPECIES OF AUSTRALIAN LEPIDOPTERA.

BY OSWALD B. LOWER, F.E.S., Lond., &c.

[Read July 1, 1902.]

BOMBYCINA.

HEPIALIDÆ.

HEPIALUS OMBRALOMA, n. sp.

Male, 50 mm. Head, palpi, thorax, legs and abdomen fuscous, anterior half of abdomen clothed with brignt orange-red hairs above. Antennæ ochreous. Forewings elongate-triangular, costa sinuate, posteriorly moderately arched, termen obliquely rounded continuously with inner margin, dark ochreous-fuscous, markings not traceable; cilia dark fuscous. Hindwings with termen rounded; reddish-orange; a dark fuscous band along termen, broad at apex, gradually attenuated to beyond middle, where it terminates; cilia dark fuscous, becoming reddish-orange along inner margin and anal angle. Underside of both wings reddish-orange; forewings with a broad dark fuscous band along termen; hindwings with similar band, but sharply interrupted in middle by ground color.

Port Lincoln, South Australia; one specimen (*Coll. Lyell*).

ARCTIADÆ.

COMARCHIS EPIGYPSA, n. sp.

Female, 22 mm. Head and thorax snow-white, face ochreous, with a black bar above middle, thorax with a median fuscous spot. Antennæ and palpi fuscous, palpi yellowish externally. Legs and abdomen orange, anterior legs infuscated. Forewings elongate-triangular, termen obliquely rounded; snow-white, markings fuscous; a very short oblique streak at base; a moderate large flattened triangular costal patch, extending from near base to beyond middle, from lower edge of which proceeds a double angulated line to above innermargin at one-third; a moderately large suffused blotch immediately beyond, resting on innermargin and reaching half across wing; a broad irregular patch along termen, constricted towards costa and separated on lower half from preceding patch by a

streak of ground color; an irregular quadrate spot on costa before apex; a smaller spot just before it, from which proceeds an outwardly curved series of spots terminating on upper edge of innermarginal patch; a fine white subterminal line; cilia fuscous, becoming mixed with whitish scales at base. Hindwings orange-yellow; a narrow fuscous apical streak; cilia orange, fuscous-tinged around apex.

Penola, South Australia; one specimen, in November.

BOMBYCIDÆ.

EUPROCTIS EURYZONA, n. sp.

Male, 22 mm. Head, thorax, palpi, legs and abdomen dark orange fuscous. Antennæ ochreous, pectinations fuscous. Forewings elongate-triangular, termen strongly rounded, oblique; deep ochreous-fuscous minutely irrorated with dull ochreous-whitish scales; costal edge paler ochreous; two moderately thick ochreous-fuscous transverse fasciæ, first before middle, moderately straight; second from two-thirds costa to innermargin to before anal angle, moderately curved outwards on upper half; cilia ochreous-fuscous, terminal half lighter. Hindwings dull orange; paler on basal half; cilia as in forewings.

Henley Beach, South Australia; two specimens, in November.

BOMBYX (COSMOTRICHE) OXYGRAMMA, n. sp.

Male, 38 mm. Head and thorax ashy-grey, palpi dark fuscous. Antennæ whitish, pectinations 6, dark fuscous. Abdomen and legs ashy-grey, tarsi ringed with whitish. Forewings elongate-triangular, costa faintly sinuate, termen rounded, somewhat oblique; cinereous-grey; median third somewhat tinged with ochreous; a long round black discal spot in middle; a thick, well-defined, very strongly dentate transverse black fascia, from just before apex to beyond middle of innermargin, continued as a moderate streak along innermargin towards base; veins faintly outlined with ochreous-fuscous; a row of large black spots along termen and base of cilia; interneural spaces with fine black lines, continued to spots along termen; cilia greyish. Hindwings with termen rounded; white; costal edge fuscous; spots along termen and cilia as in forewings.

Related to *mioleuca*, Meyr., and its allies; but very distinct by the curious oblique strongly dentate black fascia and discal dot. It is an easily recognised species.

Broken Hill, New South Wales; one specimen, in May.

Darala heliopa, n. sp.

Female, 40 mm. Head, thorax, palpi, and abdomen yellowish-ochreous. Legs ochreous fuscous. Antennæ whitish-ochreous, pectinations nearly 3. Forewings elongate-triangular, termen rather strongly rounded; yellowish-ochreous, darker on basal two-thirds; a suffused purplish-fuscous moderately thick line, from costa at one-fourth to innermargin at one-fourth, sharply curved inwards on lower two-thirds; a thick, well-defined, hardly waved, purplish-fuscous line from costa at two-thirds to innermargin at two-thirds, gently curved outwards on upper half; a small purplish-fuscous, whitish-centred spot above middle, just beyond first line; a second, larger, in a direct line, considerably beyond; ground color between the two lines suffused with purplish fuscous; a curved row of small fuscous subterminal dots; cilia yellow. Hindwings with termen rounded; color as in forewings; first line absent; discal dots, second line, subterminal line, and cilia as in forewings; discal dots more pronounced beneath.

Derby, Western Australia; two specimens, in October.

I have seen specimens from Mackay, Queensland.

Darala callixantha, n. sp.

Female, 40 mm. Head, palpi, thorax, antennæ, legs, and abdomen bright canary-yellow. Forewings elongate-triangular, termen strongly bowed, oblique; bright canary-yellow, with four faint fuscous transverse lines; first from costa at one-fourth to innermargin at one-fourth, slightly curved outwards; second nearly straight, slightly curved beneath costa, from costa at two-thirds to innermargin at two-thirds; third parallel and similar, from costa at three-fourths to before anal angle; fourth subterminal, parallel to third; a dark fuscous subcostal spot at one-third from base; a second in a direct line, considerably beyond; cilia yellow. Hindwings with termen rounded; color, cilia, and all markings, except first line, as in forewings.

A pretty species, not near any other known to me.

Derby, Western Australia; one specimen, in December.

LIMACODIDÆ.

Doratiphora, Westw.

I employ this name for those species possessing the following characters, which are drawn from *vulnerans*, Lewin (*Bombyx V.*, Prodr. Ent., p. 5, t. 4, 1805), which I assume to be the type.

Head densely haired, moderately smooth. Palpi porrect, moderate, densely haired, terminal joint very short, sometimes concealed by hairs of second joint. Antennæ more than half in male, bipectinated to apex, pectinations extremely short on terminal half. In female very shortly dentate throughout. Abdomen and legs densely haired, tibiæ and tarsi haired above. Forewings with vein 1 furcate towards base, 2 from about two-thirds from base, 7 and 8 out of 9; generally 10 out of 9 near base, sometimes considerably before base, sometimes from slightly beyond base of 9. Hindwings with 3 and 4 separate, 6 and 7 stalked or from a point, 8 connected with cell towards base. The variations in structure of forewings are to be found in the same species; the structure of hindwings is more constant, excepting that in two instances 6 and 7 are long stalked.

I have the following species:

DORATIPHORA VULNERANS, Lew.

(*Bombyx vulnerans*, Lewin, Prod. Ent., p. 5, t. 4, 1805; *Doratiphora V.*, Westw., Exot. Moths, p. 181, 1841.)

Adelaide, South Australia; Melbourne, &c., Victoria; Sydney, New South Wales; Brisbane to Cape York, Queensland.

Somewhat variable, but easily recognised. The specimens from Queensland are darker colored.

DORATIPHORA QUADRIGUTTATA, Walk.

(*Anapea quadriguttata*, Walk., Lep. Hep., cxxxii., 474, 1865.)

Adelaide, South Australia, to Brisbane, Queensland.

Varies somewhat; sometimes the 2 upper spots of forewings are obliterated by ground color, more especially in male specimens.

DORATIPHORA EUCHRYSA, Lower.

(Trans. Roy. Soc., S.A., p. 152, 1896.)

Vein 10 out of 9 considerably before base, 6 and 7 of hindwings short stalked. Palpi rather small.

Northern Queensland.

DORATIPHORA HEMISTAURA, n. sp.

Female, 38 mm. Head, thorax, palpi, antennæ, legs and abdomen pale yellow, thorax fuscous in middle, palpi moderate, porrect, moderately smooth, terminal joint short, exposed. Forewings elongate, moderate, termen rounded, strongly oblique; 10 from base with 9; pale yellowish; some blackish scales before base in middle; moderate, reddish ochreous, irre-

gular, triangular patch above innermargin before middle, edged with paler, indented strongly on either side; a small black discal mark in middle of wing; a broad outwardly curved obscure transverse ochreous fascia, from three-fourths of costa to anal angle; cilia yellowish, with fuscous median and subterminal lines. Hindwings with veins 6 and 7 short-stalked; pale yellowish-orange; cilia pale yellowish orange.

Nearest *euchrysa*, but very distinct by the reddish patch of forewings.

Mackay, Queensland; one specimen, in November.

Doratiphora brachyopa, Lower.

(P.L.S., N.S.W., p. 10, 1897.)

In the female of this species vein 10 is out of 9 considerably before base; the same peculiarity is observed in *euchrysa*. The male, however, has 9 and 10 starting at the same point, and in one specimen almost separate at base. Palpi short, shortly haired beneath, terminal joint very short, exposed.

Mackay and Cooktown, Queensland.

Doratiphora amphibrota, n. sp.

Male and female, 24-26 mm. Head, thorax, legs, and abdomen deep reddish. Palpi very short, haired beneath, terminal joint minute. Antennæ ochreous, bipectinated to apex, pectinations at greatest length 6, very short on terminal half. Forewings elongate, moderate, termen rounded, oblique; 7 out of 9 near base, 8 and 9 stalked; 10 from just beyond angle of cell, hardly touching 9; deep reddish, darker on basal two-fifths; a narrow slightly outwardly oblique white streak from just beyond one-third of innermargin to three-fourths across wing, edged posteriorly throughout by a broad dull fuscous-whitish band; a similarly colored band along termen; ground color between bands lighter than that on basal two-fifths; cilia greyish-fuscous, with a reddish basal line. Hindwings with termen rounded; 6 and 7 short-stalked; light reddish; cilia light reddish.

Not unlike a small specimen of *Lethocephala bombycoides*, Feld., but neuration is different.

Derby, Western Australia; three specimens, in October.

Doratiphora perixera, n. sp.

Male, 20 mm. Head, palpi, thorax, legs, and abdomen dark fuscous, palpi very short short, terminal joint minute, patagia ochreous-grey. Antennæ reddish-ochreous, bipectinated to apex, pectinations at greatest length 6, terminal half

very short. Forewings elongate, moderate, termen obliquely rounded; 10 out of 9 before base, or from a point with 9; greyish-ochreous; darker on basal third; costal edge pale ochreous; a dark reddish-fuscous mark on innermargin at one-third; a second, similar, obliquely above, more or less joined to preceding; a similarly colored larger spot in middle of disc, at two-thirds from base; cilia greyish-ochreous, with a dull reddish-ochreous basal line. Hindwings with termen rounded; 6 and 7 stalked; pale reddish; darker along inner margin; cilia as in forewings.

Allied to preceding; differs in color and markings.

Derby, Western Australia; two specimens, in October.

DORATIPHORA (?) LIOSARCA, n. sp.

Male 24 mm. Head, thorax, palpi, antennæ, legs, and abdomen pale fleshy red. Antennæ bipectinated to apex, pectinations at greatest length 6, gradually becoming shorter on terminal half. Forewings elongate, moderate, costa hardly arched, termen obliquely rounded; 8 and 9 out of 7 near base; 10 from beyond angle of cell, not connected with 9; pale fleshy-red, without markings; cilia pale ochreous, with an ochreous basal line. Hindwings with termen rounded; pale ochreous-reddish, cilia as in forewings.

Differs from two preceding species by absence of markings.

The different form of the antennæ from most of the previously described species makes this species rather discordant, but its apparent affinity renders it necessary to place it here. I have what I consider the female, in which the antennæ is also bipectinated to apex, pectinations 2, but it is not in a condition to decide with certainty. Should it prove so, then a new genus will be necessary, as although it agrees in structure fairly well the antennæ would remove it from this genus.

Derby, Western Austrlia; four specimens, in poor condition, in November.

DORATIPHORA SPHENOSEMA, n. sp.

Male, 30 mm. Head, thorax, legs, and abdomen deep mahogany-red, tarsi ringed with ochreous. Palpi deep reddish, internally ochreous. Antennæ reddish, bipectinated to apex, pectinations ochreous, at greatest length 6, terminal half very short. Forewings elongate, moderate, termen obliquely rounded; ochreous reddish; 10 from just beyond angle of cell, not touching 9: a short oblique fuscous streak from inner margin at one-third, reaching one-fourth across wing, edged by its own width of obscure grey; a moderate reddish spot in middle of disc, at two-thirds from base; cilia reddish-grey,

with an ochreous-reddish basal line. Hindwings with termen rounded; light reddish-ochreous, becoming more reddish along innermargin and base; cilia as in forewings, but mixed with dark reddish.

Allied to previous species, differing in color, markings, also neuration; in the latter somewhat approaching *Lethocephala*, Feld.

Cooktown, Queensland; two specimens, in November.

DORATIPHORA EUMELA, Lower.

(Trans. Roy. Soc., S.A., p. 153, 1896.)

Vein 7 of forewings not connected with 9; 10 out of 9 well before angle. Hindwings with 6 and 7 stalked or from a point. Palpi very short, terminal joint minute.

The difference in neuration of this and the following species I regard as specific only.

In one specimen the neuration of hindwings is normal; in another 6 and 7 from a point.

Mackay and Townsville (*Dodd*), Queensland.

DORATIPHORA ASPIDOPHORA, n. sp.

Male and female, 22-30 mm. Head, palpi, thorax, antennæ, legs, and abdomen deep chocolate, thorax mixed with reddish in middle, palpi very short, terminal joint minute. Forewings elongate, moderate, costa somewhat sinuate in middle, termen obliquely rounded; 7 separate from, but closely approximated to 9 at base; 10 out of 9 well before angle; deep chocolate; a narrow oblique transverse line from costa at three-fourths to inner margin in middle, edged posteriorly by a lighter parallel shade throughout; a moderately large deeper chocolate, somewhat ovoid, blotch below apex, just before termen, anterior edge suffused, posterior edge sharply defined; cilia deep chocolate. Hindwings and cilia deep chocolate; 6 and 7 from a point.

Feeds on *Eucalyptus sp.* Cocoon oviform, smooth, snow-white.

Derby, Western Australia, two specimens, in October.

I have seen specimens from Queensland.

DORATIPHORA NEPHROCHRYSA, n. sp.

Male, 20 mm. Head, thorax, ond abdomen dark greyish-fuscous. Legs dark fuscous, very densely haired, posterior legs ochreous-tinged. Palpi porrected, bright ochreous, moderately smooth, terminal joint short, exposed, distinct. Antennæ ochreous-fuscous, bipectinated to apex, at greatest length 6,

terminal half very short. Abdomen dark fuscous. Forewings elongate, moderate, costa faintly sinuate in middle; 10 from a point with 9; dark fuscous; a narrow ochreous streak along costa; a well-marked irregularly shaped bright orange-ferruginous spot above innermargin at one-third; some ochreous scales along termen; cilia dark fuscous, with ochreous-whitish spots towards base. Hindwings with termen rounded; 6 and 7 from a point; blackish-fuscous; cilia as in forewings.

This species could form the type of a new genus on account of the palpi and neuration, but in the absence of further material I place it in *Doratiphora*.

Mackay, Queensland; one specimen, in poor condition, in November.

DORATIPHORA (?) ORDINATA, Butler.

(*Doratiphora ordinata*, Butl., T.E.S., Lond., 388, 1886.)

I hesitate to refer this species to *Doratiphora*, veins 7 and 10 are both separate from 9; in other respects it agrees with the genus. I have only the female.

Townsville and Cooktown, Queensland.

LETHOCEPHALA EREMOSPILA, n. sp.

Male, 30 mm. Head, thorax, palpi, abdomen, and legs deep mahogany-red, thorax darker in middle, terminal joint of palpi reddish-orange, all tarsi with broad ochreous rings. Antennæ reddish, bipectinated to apex, gradually narrowed on apical portion, at greatest length 6, pectinations ochreous. Forewings elongate, moderate, costa straight, termen obliquely bowed; 7 and 9 free a point or closely appromximated at base; 10 separate, from just beyond angle; deep mahogany-red; a short black strongly outwardly oblique streak on innermargin at one-third only reaching to vein 1; cilia deep mahogany-red, terminal half fuscous, separation obscure. Hindwings with termen round; 6 and 7 stalked; ochreous-reddish, thickly clothed with reddish hairs along innermargin; cilia as in forewings.

Not unlike specimens of the preceding genus, but the antennæ are different, in addition to neuration.

Mackay, Queensland; two specimens, in October.

LETHOCEPHALA CALLIDESMA, Lower.

(Trans. Roy Soc., S.A., p. 153, 1896.)

I formerly queried the generic location of this species, but I think it rightly referred.

DASYCOMOTA, n. g.

Head and thorax densely haired, moderately smooth. Palpi porrect, second joint triangularly scaled, terminal joint concealed. Antennæ bipectinated to apex, shorter on apical sixth. Forewings with 2 from three-fourths; 7 and 8 out of 9; 10 separate, closely approximated to 9 at base. Hindwings with 6 and 7 stalked.

Closely allied to *Lethocephala*, Feld., differing principally by the antennæ. Perhaps it need not be separated.

Dasycomota pyrrhœa, n. sp.

Male, 30 mm. Head, thorax, palpi, legs, and abdomen dark reddish, thorax lighter anteriorly. Antennæ reddish, bipectinated to apex, shorter on apical sixth, at greatest length 4. Forewings elongate, moderate, costa sinuate, termen strongly rounded in middle, oblique; dark reddish, minutely irrorated with deeper red, deepest on basal third and beyond line; a narrow nearly straight reddish-fuscous line from costa at five-sixths to inner margin at two-thirds, very slightly curved outwards on upper half, edged anteriorly throughout by its own width of grey-whitish; cilia reddish-fuscous; terminal third darker. Hindwings with termen rounded; reddish-fuscous, paler on basal half; cilia as in forewings, but paler towards base.

Easily recognised by the transverse whitish-edged line of forewings.

Cooktown, Queensland; three specimens, in December.

Momopola cosmocalla, n. sp.

Male and female, 38-42 mm. Head and palpi carmine. Thorax fleshy-ochreous, anteriorly and posteriorly carmine-tinged. Antennæ ochreous, pectinations in male at greatest length 6, in female fiiliform. Abdomen whitish, carmine-tinged. Legs whitish-carmine, joints and tarsal rings of anterior and middle legs black. Forewings elongate, moderate, costa rather strongly arched, termen gently rounded, oblique; 7 and 8 out of 9, 10 out of 9 below 7; fleshy-ochreous, more or less suffused with carmine throughout; costal edge broadly carmine; a narrow inwardly oblique fuscous transverse line, from middle of inner margin towards costa at three-fourths, but not near reaching it, sometimes absent; cilia ochreous-grey, mixed with carmine, tips fuscous. Hindwings with 6 and 7 stalked; pale ochreous-whitish, delicately suffused with pale carmine on terminal half; cilia pale ochreous-whitish, at base partly carmine-tinged.

Duaringa, Queensland; three specimens, received from late Mr. G. Barnard, taken in February.

ANISOBATHRA, n. g.

Head rough-haired. Palpi rather long, moderately porrected, rough scaled, terminal joint short, exposed. Antennæ over one-half, in male bipectinated to apex, apical ½ very short, in female shortly serrate. Posterior tibiæ and tarsi not haired. Forewings with vein 1 furcate, 2 from three-fourths; 8 and 9 out of 7 near base; 10 absent. Hindwings 6 and 7 stalked; 8 connected with cell near base.

Differs from the preceding genera by absence of vein 10, &c.

Anisobathra actinias, n. sp.

Male and female, 22 mm. Head, face, thorax, and palpi whitish, palpi fuscous on sides. Abdomen and legs ochreous-fuscous. Antennæ fuscous, pectinations at greatest length 5, terminal half very short, separation abrupt. Forewings elongate, rather short, costa moderately arched, more strongly in female, termen bowed, oblique; light fuscous, irregularly suffused with whitish; a narrow oblique white streak from middle of inner margin to middle of lower margin of cell; ground color anteriorly darker; a narrow white streak, from costa at two-thirds, thence strongly curved around to meet apex of previous streak; ground color anteriorly darker, towards base whiter; a narrow curved white subterminal streak parallel to termen; ground color between this and former streak deep fuscous on upper third, whitish below; cilia white, with light fuscous median and terminal lines. Hindwings dull reddish; cilia as in forewings.

Mackay, Queensland; two specimens, in December.

NOCTUINA.

CARADRINÆ.

Prometopus malacopis, n. sp.

Male and female, 28-32 mm. Head, thorax, palpi, and antennæ light fuscous, more or less mixed with dull whitish, apical half of second joint of palpi ochreous-whitish, antennæ shortly ciliated, about 1. Abdomen greyish. Legs whitish-fuscous, anterior and middle tibiæ and tarsi somewhat banded with fuscous. Forewings elongate, moderate, costa hardly arched, termen faintly waved, obliquely rounded; fuscous; lines blackish, waved, indistinct, subbasal dentate; first median, and second only indicated on lower half; subterminal shortly excavated above and below middle, followed by a dull ochreous-fuscous shade throughout, which reaches termen; a sharp black line along fold, from base to one-third; a fine black inter-

rupted line along termen; orbicular small, yellowish; reniform moderate, ochreous; cilia fuscous, mixed with blackish in middle, becoming somewhat ochreous at base. Hindwings with termen faintly waved; whitish fuscous, lighter on basal half; a fuscous discal spot; an interrupted fuscous line along termen; cilia whitish.

Closely allied to *melodora*, Lower, but differs by paler forewings and arrangement of lines.

Broken Hill, New South Wales; Parkside and Exeter, South Australia; Birchip and Stawell, Victoria; four specimens, in November.

PROMETOPUS HELIOSEMA, n. sp.

Male, 26 mm. Head, thorax, and antennæ dark fuscous, collar broadly whitish posteriorly, antennæ shortly ciliated 1. Palpi fuscous, second joint whitish, apex fuscous. Abdomen and legs greyish-fuscous, anterior tibiæ and tarsi more or less banded with ochreous. Forewings elongate, moderate, costa hardly arched, termen faintly waved, obliquely rounded; dark fuscous; all lines lost in general ground color; a thick suffused whitish subcostal streak, from base to one-fifth; a short red dash on fold at one-fourth; orbicular moderate, roundish, bright red, finely edged with black; reniform moderate, reddish-ochreous, posteriorly becoming whitish on lower half; subterminal blackish, dentate, faintly indicated; a moderately broad dull reddish-ochreous line along termen; fine fuscous line along termen; cilia ochreous somewhat barred with blackish. Hindwings with termen faintly waved; fuscous whitish, lighter on basal half; a fuscous discal spot; cilia whitish.

This species stands in some collections as *tortisigna*, Walk. (= *costalis*, Feld.)

Broken Hill, New South Wales; Parkside, South Australia; Melbourne and Gisborne, Victoria; several specimens, in November.

PROMETOPUS RHODOCENTRA, n. sp.

Female, 24 mm. Head, thorax, and antennæ dark fuscous Palpi whitish-fuscous. Abdomen and legs grey-whitish, anterior tibiæ and tarsi more or less banded with fuscous. Forewings elongate, moderate, costa hardly arched, termen faintly waved, obliquely rounded; dark fuscous; lines blackish rather thick; subbasal and first and subterminal indistinct; median slightly waved, oblique; second similar, slightly curved to beneath reniform; a more or less well developed rather thick reddish line along fold; orbicular small red, edged with black; reniform roundish, moderate, bright red, edged with black; a

fine fuscous line along termen; cilia light fuscous. Hindwings with termen faintly sinuate below apex; fuscous whitish; cilia whitish with a fuscous median line.

Broken Hill, New South Wales; two specimens, in April.

CARADRINA ATMOSCOPA, n. sp.

Male, 26 mm. Head, palpi, thorax, and antennæ dark fuscous, antennæ dentate, ciliations nearly 1, palpi internally ochreous. Legs fuscous-whitish, tibiæ ringed with ochreous. Forewings elongate-triangular; costa gently arched, termen faintly waved, obliquely rounded; dark fuscous; costa spotted with dull ochreous; first line dull whitish, with two long sharp angulations above and below middle; median indistinct; second line dull whitish, dentate throughout, with a long projection outwards above, thence terminating above innermargin before middle, where it reaches a small semi-circular black line; subterminal strongly dentate, obscurely whitish; all veins on space between subterminal and termen sharply outlined with black, one above middle more distinct and continued to middle of reniform spot; a black line along fold, from base to before middle; orbicular small, dull ferruginous, outlined with black; reniform small, whitish, anteriorly edged by a black line; a row of suffused blackish spots along termen, at extremities interneural streaks; cilia dark fuscous, darker on basal half. Hindwings with termen faintly waved; fuscous, darker on terminal half; cilia whitish, with a fuscous subbasal line.

Between *microdes*, Lower, and *microspila*, Lower, differing from both by the neural streaks and other details.

Broken Hill, New South Wales; two specimens, in April.

CARADRINA (*l*) OCHROLEUCA, n. sp.

Male, 40 mm. Head, thorax, palpi, antennæ, and abdomen pale ochreous-whitish, palpi short, more whitish beneath. Antennæ bipectinated to apex, pectinations at greatest length 4, shorter on apical third, thorax and abdomen without crests. Legs whitish. Forewings elongate, moderate, costa almost straight, termen nearly entire, obliquely rounded; pale ochreous; lines ochreous, faintly outlined; first and median oblique, waved, moderately thick; first angulated on fold; second shortly dentate throughout, curved inwards on lower third; orbicular obsolete; reniform faint, fuscous, crescentic; subterminal faintly indicated; cilia pale ochreous, with a darker basal line. Hindwings with termen rounded; prismatic whitish; a faint fuscous discal spot; cilia similar.

Doubtfully referable to *Caradrina*. It recalls some species of *Leucania*, the antennæ of the species are bipectinated to apex, a character which would indicate a distinct genus, but as a similar character occurs in some European species, it seems better, in the absence of further material, to consider it specific only.

Fraser's Range, Western Australia; one specimen, in June.

CARADRINA (?) PELOSTICTA, n. sp.

Female, 28 mm. Head, thorax, palpi, and antennæ ochreous, palpi porrected, second joint more than twice as long as terminal, finely haired beneath. Abdomen and legs white. Forewings elongate, moderate, costa nearly straight, termen gently waved, strongly bowed, oblique; ochreous, mixed with whitish-ochreous and somewhat infuscated; costal and dorsal edges darker; an obscure elongate light fuscous suffusion lying in middle below cell, with a fuscous spot in middle of upper edge; an obscure light fuscous streak, from termen below apex to inner margin at anal angle; an interrupted waved fuscous line along termen; cilia fuscous, with darker fuscous, terminal and subterminal lines. Hindwings with termen faintly waved; white, thinly scaled; a faint fuscous line along termen; cilia white.

This species and the three following will require new genera to receive them, but in the absence of the males I prefer to place them here provisionally.

Broken Hill, New South Wales; one specimen, in February.

CARADRINA (?) LICHENOPHORA, n. sp.

Female, 30 mm. Head and thorax cinereous-grey, face whitish, thorax somewhat crested posteriorly. Antennæ fuscous. Palpi nearly porrect, second joint moderate, terminal joint short, blackish above, whitish beneath. Abdomen and legs grey-whitish, tarsi black, ringed with white. Forewings elongate, moderate, costa gently arched, termen faintly waved, nearly straight on upper half, thence strongly oblique; cinereous-grey; lines black, well defined; subbasal nearly straight, hardly reaching inner margin, followed by a thicker parallel line on its lower half; first line from one-fourth costa to one-fourth inner margin, outwardly oblique on upper two-thirds, thence gently sinuate inwards, edged anteriorly more or less throughout by a fine parallel line, between subbasal and first lines the ground color is sprinkled with lichen-like scales, which form a blotch below middle; median irregular, commencing from just beyond first, continued very obliquely outwards to

inner margin in middle, second from a suffused blackish patch in middle to three-fourths of inner margin, with a long sharp projection in middle and a very short one above innermargin; subterminal obsolete, strongly waved; area beyond second line more or less irrorated with lichen-like scales, becoming blotch-like above anal angle; orbicular and reniform large; cinereous, edged with black; a blackish lunulate line along termen; cilia cinereous fuscous. Hindwings with termen irregularly waved; whitish; median line fuscous, indistinct; second fuscous, tolerably distinct, dentate throughout; a moderately broad fuscous band along termen, upper edge similar and parallel to second line; a fuscous line along termen; cilia whitish.

Distinct by the lichen-like scales on forewings.

Melbourne, Victoria; one specimen, in November.

CARADRINA (?) CALLICHROA, n. sp.

Female, 34 mm. Head and thorax ochreous-fuscous, patagia and thorax posteriorly mixed with white scales. Palpi moderately porrected, ochreous, fuscous above. Antennæ ochreous. Abdomen and legs greyish, abdomen with strong fuscous crests, median largest, tarsi fuscous above, banded with whitish. Forewings elongate, moderate, costa hardly arched, termen waved, straight on upper half, thence strongly oblique, dorsum gently sinuate before anal angle; fuscous, mixed with fine whitish scales, except on median third; lines black, moderately indicated; subbasal twice sinuate, not reaching dorsum; first from one-fourth costa to one-fourth innermargin, waved throughout and curved inwards; median shade thick, oblique, rich chocolate-brown, limited by median line, which ends on innermargin at two-thirds; second strongly crenulate, curved outwards and tending to be continued along veins, from costa just beyond edge of median shade to inner margin close beyond termination of median line; the white scales form a more or less whitish fascia between last two lines, constricted on lower half; in the upper half is a curved streak of fuscous, indicating edge of reniform; subterminal fuscous, edged posteriorly by a parallel whitish line; a waved dark fuscous line along termen; cilia fuscous, with a waved whitish basal line. Hindwings with termen waved; whitish-fuscous; a moderately large lunular fuscous discal spot; second line moderate, dentate distinct, indented below middle; a broad suffused fuscous band along termen; cilia white, with a fuscous subbasal line.

A richly colored species.

Melbourne, Victoria; one specimen, in November.

CARADRINA (?) MELANOPS, n. sp.

Female, 30 mm. Head, thorax, and palpi blackish, sprinkled with a few white scales. Antennæ fuscous. Abdomen and legs fuscous-whitish, abdomen with a large blackish crest on median segment. Forewings elongate, moderately dilated posteriorly, termen faintly waved, rounded, oblique; black,; markings rather obscure; black; subbasal not traceable, first from one-fourth costa to one-third innermargin, waved, curved inwards in middle; median obliterated; second from two-thirds costa to before anal angle; first and second joined by a narrow blackish bar below middle; orbicular grey-whitish, round, large, ringed with black; reniform similar, edged anteriorly by a black line; subterminal waved; a fine blackish line along termen; cilia black, with a fuscous tooth of scales at anal angle. Hindwings with termen irregularly waved; snow-white, with a faint fuscous curved discal spot; a broad blackish band along upper half of termen; cilia snow-white, with a blackish median line, more pronounced on upper half.

Blackwood and Parkside, South Australia; two specimens in April and November.

GEOMETRINA.

HYDRIOMENIADÆ.

XANTHORRHOE RHODACRIS, n. sp.

Female, 22 mm. Head, palpi, antennæ, thorax, and abdomen reddish-ferruginous, abdominal segments narrowly white. Legs fuscous-whitish. Forewings elongate-triangular, termen faintly waved, bowed, oblique; reddish-ferruginous; two or three reddish-fuscous transverse lines between median band and base; median band broad; dark reddish-fuscous; anterior edge moderately straight, waved, from one-third costa to one-third innermargin; posterior edge with a bidentate projection in middle, from two-third costa to beyond middle of innermargin, finely edged on upper half by a dull whitish line; subterminal line waved, distinct, white; a waved interrupted blackish line along termen; cilia reddish-fuscous, darker on basal half, barred with fuscous. Hindwings with termen gently waved, rounded; greyish, tinged with reddish; lines indistinct, except on innermargin; subterminal, and line along termen as in forewings; cilia as in forewings. Underside of both wings with a large reddish apical patch, and subterminal line more or less reproduced.

In the absence of the male the correct generic position of

this species cannot be assured, but its evident relationship to *hyperythra*, Lower, suggest it being rightly referred.

Penola, South Australia; one specimen, in November.

MONOCTENIADÆ.

Nearcha anemodes, n. sp.

Female, 30 mm. Head, thorax, antennæ, and abdomen pale fleshy-ochreous, face and palpi dark fuscous, palpi snow-white beneath, abdomen whitish beneath. Legs grey-whitish, anterior pair somewhat infuscated. Forewings elongate-triangular, costa straight, termen gently bowed, oblique; pale fleshy-ochreous; a moderate fuscous discal ring below costa in middle; a row of elongate black spots along termen; cilia fleshy-ochreous. Hindwings with termen rounded; color along termen and cilia as in forewings; base of wing somewhat paler; a dark fuscous discal dot.

Very different in appearance to the other described species by the absence of all markings except discal spot.

Derby, Western Australia; one specimen, in November. I have seen a second.

Œnone xenopis, n. sp.

Male and female, 26-30 mm. Head, palpi, antennæ, and thorax dark fuscous, palpi with projecting hairs, thorax somewhat crested. Abdomen ochreous. Legs fuscous, posterior pair mixed with whitish. Forewings elongate-triangular, costa gently arched, termen faintly waved, gently bowed, oblique; dark fuscous; lines black, tolerably distinct; first from one-fourth costa to one-third innermargin, straight on upper half, sinuate inwards on lower half; median obscure, from costa before middle to before middle of innermargin; second from costa at two-thirds to innermargin before anal angle, gently and evenly curved outwards on upper half, sinuate on lower half; a moderate round black centred ochreous discal spot on median shade; a second, much larger, ovoid, similarly colored, at posterior extremity of cell, both spots faintly edged with black; an interrupted black line along termen; cilia fuscous, with median and subterminal blackish lines. Hindwings with termen rounded, waved; greyish-fuscous, lighter on basal half; median and second lines fuscous, faintly indicated, becoming sharply defined on innermargin; line along termen as in forewings; cilia greyish, with two fuscous lines.

An early and interesting type, very unlike the other described species, in appearance recalling species of *Noctuina*

Broken Hill, New South Wales; three specimens, in April and May. I have seen specimens from Victoria.

ONYCHODES (?) RHODOSCOPA, n. sp.

Female, 50 mm. Head ochreous, face whitish. Antennæ whitish, pectinations ochreous. Thorax cinereous, anteriorly ochreous. Legs and abdomen whitish, faintly ochreous-tinged. two anterior segments of abdomen orange. Forewings elongate-triangular, termen waved, hardly bowed, apex somewhat produced; pale cinereous-grey; costal edge with fine white streaks; three moderate, obscure, fuscous spots, first before middle; third at three-fourths, and second midway between first and third; from first and third proceed a faint fuscous waved line to one-sixth and four-fifths innermargin respectively, more prominent on veins, indicating limiting lines of median band; from second proceeds a moderate, faint, fuscous median shade; cilia whitish, with elongate fuscous interneural streaks at base. Hindwings with termen faintly waved; whitish, faintly pinkish tinged on median area; median shade and second line as in forewings; costal spots absent; a dull purplish-fuscous band around termen, more prominent on upper half; cilia whitish. Underside of wings beneath with costa pale whitish-ochreous, strigulated with fuscous; posterior area somewhat pinkish tinged; median and second line faintly indicated; dorsal third whitish.

Doubtfully referable to *Onychodes*, more probably referable to *Bombycina*. The pectinated antennæ are noticeable.

Derby, Western Australia; one specimen, in October.

GEOMETRIDÆ.

TIMANDRA MALACOPIS, n. sp.

Male, 25 mm. Head, thorax, palpi, legs, and abdomen dull fleshy-ochreous, face ochreous. Antennæ whitish, pectinations ochreous, at greatest length 6. Forewings elongate-triangular, costa nearly straight, termen somewhat prominent in middle, faintly sinuate on upper half, obliquely bowed on lower half; pale fleshy-ochreous; a fine fuscous dot above innermargin at one-fourth; a second, similar, just above, and indications of a third on costa at one-fourth; a fuscous discal dot; a nearly straight narrow ochreous line, edged anteriorly by its own width of fuscous, from costa at three-fourths, where it is slightly curved outwards, thence proceeding obliquely to inner margin at two-thirds; a more or less indicated row of small fuscous spots beyond and parallel to streak; an obscure ochreous-whitish line along termen; cilia fleshy-ochreous. Hindwings with termen sharply angulated in middle; 3 and 4 stalked; 6 and 7 stalked; color, cilia, and markings as in forewings, but discal dot absent.

Nearest *aventiaria*, Gn., but differs in color, different form of line, and especially by the termen of forewings being only slightly prominent in middle.

Derby, Western Australia; one specimen, in October.

Emmiltis achroa, n. sp.

Male, 16-18 mm. Head, palpi, thorax, antennæ, legs, and abdomen dark fuscous, antennal ciliations 2, abdomen with whitish-ochreous segmental rings. Forewings elongate-triangular, termen rounded, oblique; dull whitish, strongly irrorated with fuscous, so as to appear dark fuscous; a fine waved blackish line, from costa at one-third to innermargin at one-third; slightly sinuate above innermargin; a blackish discal spot at posterior extremity of cell; median shade moderately thick, bent outwards to touch discal spot; a fine dentate black line, commencing from a black spot on costa, just before three-fourths to inner margin before anal angle, edged posteriorly by its own width of dull whitish; area of wing beyond darker fuscous subterminal whitish, hardly traceable, a fine black terminal line, somewhat interrupted; interruptions filled in with whitish scales; cilia fuscous, mixed with some whitish scales. Hindwings with termen rounded; color as in forewings, but somewhat reddish-tinged; markings and cilia as in forewings, but first line absent.

Recalls species of *Leptomeris*, but the absence of apical spurs on posterior tibiæ remove it from that genus.

Hobart, Tasmania; three specimens, taken in November.

Euchloris paraphylla, n. sp.

Male, 20-24 mm. Head and thorax pale green. Antennæ white, fillet pinkish, pectinations 5, inner series pinkish tinged. Palpi pinkish. Abdomen pale green, sides and beneath white. Legs crimson tinged, anterior coxæ green, posterior legs whitish, tibiæ thickened. Forewings elongate-triangular, termen nearly straight, oblique; pale green, somewhat tinged with bluish; a narrow yellowish costal streak, leaving extreme costal edge crimson throughout; cilia green. Hindwings with termen rounded; color and cilia as in forewings.

Apparently nearest *asemanta*, Meyr.

Derby, Western Australia; two specimens, in November.

SELIDOSEMIDÆ.

Diastictis retinodes, n. sp.

Female, 30-32 mm. Head, thorax, palpi, antennæ, and legs light ochreous. Abdomen greyish-ochreous. Forewings elon-

gate-triangular, costa arched towards base, termen sharply angulated on vein 4, sinuate on upper half, nearly straight beneath; pale ochreous, minutely and sparsely irrorated with fuscous scales; 10 out of 11, hardly touching 9 below 8; 12 free; indications of a moderate, slightly outwards curved line, from one-third costa to one-third innermargin; a well-defined waved fuscous line, from costa at five-sixths to two-thirds innermargin, suffusedly edged anteriorly with fuscous, caused by accumulation of scales; a fuscous dot midway between the two lines; a row of fuscous dots along termen; cilia ochreous. Hindwings with termen waved, shortly produced in middle; color, second line and discal dot as in forewings; cilia as in forewings.

Parkside, South Australia; two specimens, in July.

DIASTICTIS PYCNOCHROA, n. sp.

Female, 30 mm. Head, palpi, antennæ, and thorax deep fuscous purplish, palpi greyish beneath at base. Legs greyish. Abdomen greyish, somewhat purplish-tinged. Forewings elongate-triangular, costa arched towards base, termen sharply angulated on vein 4, sinuate on upper half, nearly straight beneath; 10 out 11 considerably below 8; 12 free; deep purplish-fuscous; a transverse row of small dark fuscous, posteriorly whitish edged spots, from costa at three-fourths to inner margin at three-fourths; indications of a similar row of dots along termen; cilia deep purplish-fuscous. Hindwings with termen irregularly waved; whitish, suffusedly irrorated with dull purplish-fuscous, darker on terminal half; line of dots as in forewing faintly outlined; cilia dark purplish-fuscous.

Parkside, South Australia; one specimen, in November.

PAUROCOMA, n. g.

Face with flattened projecting horny frontal prominence, more pronounced in female. Palpi moderate, porrected, rough scaled, terminal joint moderate. Thorax without crest. Posterior tibiæ somewhat dilated. Antennæ in male subdental, ciliations one-half. Forewings without fovea; 7 and 8 out of 9; 10 out of 11, anastomosing with it for a short distance, thence bent down to touch 9; 12 free. Hindwings with 3 and 4 separate; 5 absent; 6 and 7 somewhat approximated at base; 8 free.

Allied to *Amelora*, Meyr., but differs by the antennæ frontal prominence and neuration of forewings.

PAUROCOMA MOLYBDINA, n. sp.

Male and female, 24-26 mm. Head, palpi, antennæ, and thorax ashy-grey, antennal ciliations one-half, face with flat

horny frontal projection. Abdomen and legs greyish, abdomen with a lateral row of fuscous dots. Forewings elongate-triangular, termen waved throughout; rounded, oblique; grey-whitish, minutely irrorated with blackish, so as to appear greyish-fuscous; lines blackish, sometimes well developed; first from one-third costa, very strongly twice sinuate outwards, thence returning to innermargin at one-third; second from five-sixths costa to two-thirds inner margin, strongly dentate throughout, sinuate above and below middle, leaving a bidentate projection in middle; a black discal dot midway the two lines; a waved black line along termen; cilia grey-whitish, with a fuscous median line. Hindwings with termen gently waved, rounded; greyish, faintly irrorated with light fuscous beyond second line; first line and discal dot absent; second line, line along termen, and cilia as in forewings, but second line sometimes absent.

Not unlike some species of *Tareotis* (*Monocteniadæ*). The female is more obscure than male; and the second line of both wings is better developed beneath, and in fresh specimens is sometimes faintly edged with whitish posteriorly.

Broken Hill, New South Wales; three specimens, in April.

THALAINODES, n. g.

Face with broad flat horny projecting plate. Tongue developed. Palpi short, porrected, rough-scaled, terminal joint short. Antennæ in male bipectinated to apex. Thorax without crests, densely hairy beneath. Femore smooth, posterior tibiæ slightly dilated. Forewings in male with fovea; 10 out of 9, 11 anastomosing or connected with 12, sometimes with 10 also. Hindwings normal.

Intermediate in form between *Amelora*, Meyr., and *Thalaina*, Walk., but apparently most related to the latter, from which it differs by the horny projection of face and bipectinated antennæ.

Thalainodes tetraclada, Lower.

(*Amelora tetraclada*, Lower, P.L.S., N.S.W., p. 406, 1900.)

Thalainodes paronycha, Lower.

(*Amelora paronycha*, Lower, *l.c.*, p. 407, 1900.)

Having recently obtained male specimens, I find that my conjecture, that this species would possibly prove to be the female of the previous species, was unwarranted. The antennal pectinations are 4; the other details are precisely similar to the female.

THALAINODES ALLOCHROA, n. sp.

Female, 40 mm. Head and thorax greyish-lilac. Palpi white. Antennæ ochreous. Abdomen and legs greyish-ochreous. Forewings elongate-triangular, costa slightly sinuate in middle, termen bowed, oblique; greyish-lilac, without markings; a fine white costal streak, from beyond base to two-thirds; cilia greyish-lilac. Hindwings with termen hardly waved, faintly prominent in middle; 3 and 4 from a point, 6 and 7 from a point; white, thinly scaled; a moderately broad fuscous band along termen, more pronounced below apex and above anal angle; cilia white.

Allied to the previous species, but widely distinct by the absence of markings and color of forewings. It is an uncommon-looking insect.

Broken Hill, New South Wales; one specimen, in April, at light.

LOPHOSTICHA, n. g.

Face slightly prominent. Palpi moderate, ascending, rough scaled, terminal joint very short. Antennæ in male bipectinated, the extreme apex almost simple. Thorax roughened, hardly crested, densely hairy beneath. Posterior tibiæ not dilated. Forewings in male without fovea, surface with transverse rows of erect tufts of scales; 10 connected with 9, 11 and 12 free. Hindwings normal.

Closely allied to the following genus and *Stibaroma*, Meyr., different from both by the curious raised tufts of scales on forewings.

LOPHOSTICHA PSORALLODES, n. sp.

Male and female, 34-36 mm. Head, palpi, and thorax dark fuscous. Antennæ ochreous, pectinations 3. Legs dark fuscous, anterior and middle pair banded with white, posterior pair whitish. Forewings elongate-triangular, termen faintly waved; dark fuscous, more or less strigulated throughout with fine waved blackish marks, and with transverse rows of raised tufts of blackish scales; lines obscure, black; first from one-sixth costa to one-fifth innermargin, gently curved; median only traceable on middle; second from about two-thirds costa to two-thirds inner margin, rather strongly curved outwards on upper half, and with an indentation in middle; in the female the first line is preceded by a large patch of bright ochreous scales, and the second line is followed by a similar broad patch; the raised tufts in the ochreous patch are dark ochreous; veins in both sexes more or less outlined with blackish; a waved black line along termen; cilia whitish, with

a median fuscous line, and blackish points at extremities of veins. Hindwings white; a suffused light fuscous band along termen, preceded by second line, which is as in forewings, line along termen and cilia as in forewings.

The yellowish-ochreous patches on forewings of female are curious and distinct.

Birchip, Victoria; two specimens received from Mr. D. Goudie, taken in April.

AMPHICROSSA, n. g.

Face slightly prominent. Palpi moderate, ascending, rough scaled, terminal joint short. Antennæ in male bipectinated to apex. Thorax with erect bifid anterior and posterior crests, densely hairy beneath. Posterior tibiæ hardly dilated. Forewings in male without fovea; 10 connected with 9, thence anastomosing with 11; 12 free. Hindwings normal.

Allied to *Stibaroma*, Meyr., and the preceding genus, differing from both by the strongly crested thorax and neuration of forewings.

Referring to *Stibaroma*, it may be mentioned that in a specimen of *melanotoxa*, Meyr., vein 10 does *not* touch 9; the same peculiarity is noticeable in a specimen of *trigramma*, so that allowance should be made for this when determining those species. The genus is formed to receive the following.

Amphicrossa hemadelpha, Lower.

(*Stibaroma hemadelpha*, Lower, P.L.S., N.S.W., p. 265, 1897.)

Broken Hill, New South Wales; two specimens, in April and June.

PYRALIDINA.

CRAMBIDÆ.

Talis macroura, n. sp.

Male, 28 mm. Head, palpi, antennæ, and thorax light ochreous-fuscous, palpi more than twice as long as head. Abdomen and legs ochreous, posterior and middle pair fuscous tinged. Forewings elongate, moderately dilated posteriorly; costa gently arched, apex somewhat acute, termen sinuate, rather strongly oblique; yellow-ochreous, finely infuscated; a moderately narrow central longitudinal whitish streak, from base to termen, attenuated at extremities, but becoming more sudden on posterior third, edged above throughout with a fine fuscous line, more prominent in middle; a row of suffused fuscous dots along termen; cilia ochreous, with fuscous subbasal and subterminal lines. Hindwings and cilia pale yellow.

Nearest *acontophora*, Meyr., but differs by yellow hindwings. Penola, South Australia; one specimen, in April.

PYRAUSTIDÆ.

METALLARCHA, GOUDII, n. sp.

Female, 20 mm. Head, palpi, thorax, antennæ, and abdomen blackish-fuscous, abdomen with orange segmental band, patagia yellow. Forewings elongate, moderately dilated posteriorly, termen hardly rounded, oblique; blackish fuscous, with bright-yellow markings; a large elongate dorsal blotch, occupying lower third of wings; a flattened elongate spot on upper edge of dorsal patch, at one-fourth from base; a second, roundish, about middle; a third, cuneiform, at about two-thirds; a well-defined streak of yellowish-orange immediately before termen throughout; cilia blackish, becoming darker on basal half. Hindwings with termen rounded; bright orange, an elongate blackish streak along anterior half of costa, emitting a blackish tooth near posterior extremity, representing discal dot; a moderately broad black band along termen throughout, broadest at costa and becoming gradually attenuated towards extremity, and with a tooth below apex; line before termen and cilia as in forewings.

Allied to *diplochrysa*, Meyr., but differs chiefly by the absence of the white basal line in cilia, and presence of orange line before termen. I have named the species after Mr. D. Goudie, for whom I am indebted for the type.

Birchip, Victoria; two specimens, taken in January.

TORTRICINA.

TORTRICIDÆ.

CAPUA PENTAZONA, Lower.

(Tr. Roy. Soc., S.A., xxv., p. 75, 1901.)

The locality was omitted in the original description. It should be Hobart, Tasmania.

CAPUA ACRODESMA, n. sp.

Male, 10 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous, palpi greyish beneath, antennæ faintly annulated with whitish. Legs fuscous, posterior pair lighter, tarsi with whitish rings. Forewings elongate, moderate, costa moderately arched, termen oblique; dull greyish-fuscous; markings dark fuscous, mixed with a few ferruginous scales, costal fold narrow; costa marked with moderate sized spots throughout;

some scales between base and median patch, not forming definite markings; median patch narrow, oblique, from before middle of costa to beyond middle of innermargin; a small triangular spot on costa immediately beyond; a moderate, elongate spot on costa beyond, and two similar, but smaller beyond previous spot; last 3 spots sometimes somewhat confluent on costa; from first of these 3 spots proceeds a fine line to anal angle, where it becomes much broader; a fine black line along upper two-thirds of termen; cilia greyish-fuscous. Hindwings with termen gently sinuate beneath apex; fuscous, lighter towards base; cilia fuscous, with greyish subbasal line.

Near *intractana*, Walk.

Broken Hill, New South Wales; two specimens, in October.

CAPUA EPILOMA, n. sp.

Male, 14 mm. Head, palpi, antennæ, and thorax dark reddish-fuscous, palpi whitish internally and at base. Abdomen fuscous. Legs fuscous-whitish. Forewings elongate, moderate, costa strongly arched before middle, sinuate beyond; termen nearly straight; reddish-ferruginous, obscurely strigulated with darker; costal edge obscurely dark fuscous; a well-marked elongate ochreous-whitish streak on costa in sinuation beyond middle; cilia fuscous. Hindwings light fuscous, obscurely spotted with darker; cilia fuscous-whitish, with a darker fuscous subbasal line.

Bathurst, New South Wales; one specimen, in November.

DICHELIA SCOTINOPA, n. sp.

Male, 18 mm. Head, palpi, and thorax purplish-fuscous. Antennæ and legs greyish-ochreous, anterior legs fuscous. Abdomen fuscous. Forewings elongate, moderate, costa arched, termen oblique, faintly sinuate below apex; ochreous; markings dull purplish fuscous; a very large postmedian blotch, anterior edge very oblique, from one-fourth innermargin to costa beyond middle, with a more or less prominent projection in middle; costa finely spotted between base and blotch; a short streak along innermargin from base to blotch; posterior edge of blotch from just before apex to anal angle, strongly and evenly curved inwards; cilia ochreous, with a few fine fuscous scales. Hindwings with termen evenly rounded; greywhitish, finely and evenly spotted throughout with fuscous; cilia greyish.

Stawell, Victoria; one specimen, in April.

Dichelia placoxantha, Lower.

(*Anisogona placoxantha*, Lower, T.R.S., S.A., p. 160, 1896.)

Having received further specimens of this species, I consider it referable to *Dichelia*.

Tortrix anemarcha, n. sp.

Female, 20 mm. Head and thorax fuscous. Palpi and antennæ whitish-grey. Anterior and middle legs light fuscous, posterior pair whitish. Abdomen whitish. Forewings elongate, moderate, costa moderately arched, termen nearly straight; grey-whitish, densely irrorated and strigulated throughout with deep purplish-fuscous, almost obscuring ground color; cilia whitish-grey, with a fuscous-purplish line near base, prominent on upper half. Hindwings with apex rounded; grey-whitish, spotted with light fuscous; cilia grey-whitish.

New South Wales (probably near Sydney); one specimen, in June.

TINEINA.

XYLORYCTIDÆ.

Cryptophaga isoneura, n. sp.

Male, 24 mm. Head ochreous, face ochreous-whitish. Palpi ochreous-whitish, terminal joint short, half of second. Antennæ fuscous, pectinations 2. Thorax dull ochreous-whitish, anteriorly leaden-fuscous, patagia leaden-fuscous, mixed with white. Legs ochreous-whitish, posterior pair fuscous-tinged. Forewings elongate, moderate, costa gently arched, termen obliquely rounded, 2 from five-sixths; 7 to termen; ochreous-whitish, irregularly suffused with rather thick streaks of smoky fuscous, especially along costa and towards termen; all veins more or less outlined with black; a moderately large quadrate ferruginous spot at posterior extremity of cell; some ferruginous scales just below base of vein 2; a moderate ferruginous band along termen to apical fifth of costa, obliterating lines along veins; a sharp black line along termen; cilia dark fuscous. Hindwings with termen rounded; 3 and 4 from a point; 6 and 7 approximated at base; black; basal and innermarginal areas greyish, strongly haired; ferruginous band and line along termen as in forewings; cilia greyish, with black scales on basal half.

Victoria (without further record); one specimen, bred from *Casuarina*, *sp.*, in November.

Cryptophaga hyalinopa, Lower.

(Trans. Roy. Soc., S.A., p. 82, 1901.)

Female, 66 mm. Head, thorax, palpi, antennæ, legs, and abdomen as in male. Forewings as in male, but color clear fleshy-ochreous throughout; markings as in male. Hindwings pale ochreous, with a tuft of blackish hairs on innermargin above anal angle; cilia pale ochreous.

The sexes of this species are very dissimilar in the hindwings, the male having the terminal half hyaline and the basal half black.

Cooktown, Queensland; one specimen.

Xylorycta parthenistis, n. sp.

Female, 32 mm. Head and palpi white, faintly ochreous-tinged. Thorax white, very faintly ochreous-tinged anteriorly. Abdomen greyish-ochreous, segmental margins dull reddish. Antennæ and legs white. Forewings elongate, moderate, costa gently arched, termen rounded, oblique, 7 to termen; shining snow-white; a fine pale ochreous line along costa from base to apex, somewhat dilated posteriorly; cilia snow-white. Hindwings wth termen rounded, 3 and 4 from a point, 6 and 7 from a point; shining snow-white; cilia shining snow-white.

Differs from the similarly colored white species by the snow-white hindwings. It is most related to *homoleuca*, Lower, and *chionoptera*, Lower, differing from the former by the hindwings and ochreous costal streak, and the latter by the hindwings and whitish, not orange, head.

Xylorycta stereodesma, n. sp.

Female, 30 mm. Head orange, hairs somewhat erect. Palpi and antennæ fuscous, basal half of second joint externally ochreous, wholly ochreous internally. Thorax dark fuscous, anteriorly broadly white. Abdomen ochreous. Legs fuscous, posterior pair ochreous. Forewings elongate, moderate, costa gently arched, termen oblique, hardly rounded, silvery-white; 7 to termen; 2 moderately thick longitudinal black streaks, first from middle of base to apex; second along innermargin from near base to anal angle; cilia shining white, on streaks blackish. Hindwings with termen rounded; fuscous, becoming ochreous at base; 3 and 4 short stalked; cilia pale ochreous.

Probably nearest *synaula*, Meyr. It has the facies of the second section of the *Gelechiadæ*, but the termen of hindwings,

which in most of that group is sinuate beneath apex, is not at all prominent.

Perth, Western Australia; one specimen received from Mr. S. Angel, taken in November.

XYLORYCTA AMPHILEUCA, n. sp.

Male, 30 mm. Head, thorax, palpi, and antennæ grey-whitish, terminal joint of palpi fuscous beneath, patagia shining snow-white, antennal ciliations nearly 1. Legs fuscous-whitish, posterior pair slightly ochreous tinged. Abdomen light fuscous, segmental margins dull silvery, two anterior segments dull orange. Forewings elongate, moderate, termen slightly rounded; 2 from three-fourths; 5 nearer 4 than to 6; shining snow-white; a fine fuscous streak along costa from base to middle, thence continued to apex as an obscure ochreous-fuscous streak; cilia shining snow-white. Hindwings with 6 and 7 connate, 3 and 4 very short stalked; greyish-fuscous; cilia snow-white, pale ochreous at base, with light fuscous subbasal line.

Nearest *orectis*, Meyr., but differs from that and the allied species by the absence of orange on head and fuscous hindwings.

Derby, Western Australia; one specimen, in October.

XYLORYCTA TETRAZONA, Lower.

(Trans. Roy. Soc., S.A., p. 84, 1901.)

I have received a specimen of this species from Messrs. S. and F. Angel, taken at Norwood, South Australia, in which the ground color of forewings is yellow. In the type, which came from Stawell, Victoria, they are white.

TRICHLOMA, n. g.

Head smooth, tongue moderately developed. Antennæ moderate, in male filiform, simple, basal joint moderate, without pecten. Labial palpi moderately long, recurved, second joint hardly reaching base of antennæ, moderately smooth, with closely appressed scales; terminal joint nearly as long (shorter in female), as second. Thorax smooth. Abdomen moderate, anal segment beneath somewhat horny. Posterior tibiæ moderately rough-haired. Forewings with vein 1 furcate towards base, 2 from two-thirds, 3 from angle, 7 and 8 stalked, 7 to termen, just below apex, 11 from near middle. Hindwings over 1, oblong-ovate, costa moderately haired, termen faintly sinuate in middle; a large tuft of raised hairs beneath, on innermargin near base, not reaching above vein 2, but more or less continued to base of wing; 3 and 4 short stalked, 5 parallel to

4; 6 and 7 from a point, in female widely remote at origin, 8 connected with cell towards base.

Allied to *Hypertricha*, Meyr., but differing by the longer terminal joint of palpi, presence of veins 7 and 8 of forewings, and especially by the large tuft of tufts of hair beneath hindwings. In *Hypertricha* the hair appears along the costa only, and vein 7 is absent.

TRICHLOMA ASBOLOPHORA, n. sp.

Male, and female, 20-45 mm. Head, thorax, palpi, and antennæ dark fuscous, face, palpi, and base of antennæ externally whitish. Legs whitish, somewhat infuscated. Abdomen greyish-fuscous. Forewings elongate-oblong, costa gently arched, termen gently bowed; dark fuscous, mixed with whitish scales, more or less streaked with short black streaks, especially in middle; veins towards termen more or less outlined with black; extreme costal edge whitish throughout; a short, somewhat obscure, whitish mark below middle, at two-thirds from base, posteriorly edged by its own width of black; an interrupted black line along termen; cilia fuscous, with black spots at extremities of veins. Hindwings with termen faintly sinuate in middle; dark ochreous-fuscous; cilia greyish-ochreous. Tuft of hairs beneath ochreous-fuscous.

Recalls species of *Xyloryeta*, especially *epigramma*, Meyr. The three specimens before me present some curious variations in the neural structure; in the one wing of a male vein 6 of the forewing becomes furcate near termen, causing it to appear extremely long-stalked, vein 2 of the same specimen is divided in middle, thus forming a small cell, then continued as a normal vein to termen. The other wing is normal; in one female vein 5 of the forewing is absent in one wing only (coincident with 4). The generic characters given are, however, sufficiently distinct to separate it from *Hypertricha*, as I have examined many specimens of that genus, and they present no variation.

Birchip, Victoria; three specimens, bred in November by Mr. D. Goudie, who informs me that the species feed on *Casuarina* ("Bull Oak"), tunnel into the straight branches, and form a silky covering over the aperture.

COMOSCOTOPA, n. g.

Head with appressed hairs. Antennæ moderate in male, filiform, with long ciliations (3), without pecten. Labial palpi moderate, curved, smooth scaled, terminal joint, shorter than second. Thorax smooth. Abdomen moderate. Forewings

with vein 1 furcate towards base, 2 from near angle, 3 and 4 stalked, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwing slightly over 1, ovate-oblong, more or less clothed with fine hairs towards base, 3 and 4 moderately stalked, 5 somewhat remote from 4, 6 and 7 stalked.

Closely allied to *Phylomyctis*, Meyr., but differs in the strongly ciliated antennæ; it forms a transitional link between that genus and *Agriophara*, Ros.

COMOSCOTOPA LEUCOPELTA, n. sp.

Male, 14 mm. Head, palpi, thorax, and legs dull whitish, face whitish, palpi fuscous, internally, posterior legs infuscated, antennæ fuscous, spotted with white, ciliations 3, abdomen blackish fuscous. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; blackish-fuscous, extreme costal edge whitish, more pronounced in middle; a large somewhat ovoid whitish basal patch, extending from base to one-third, but not reaching dorsum; some faint whitish scales forming two obscure parallel curved series; cilia blackish fuscous, with some white scales. Hindwings with termen rounded; blackish; cilia blackish-fuscous, with a darker basal line.

Not unlike *Phylomictis maligna*, Meyr., but hindwings are nearly black.

Mount Gambier, South Australia; one specimen, in November.

ŒCOPHORIDÆ.

EOMYSTIS TRISELENA, n. sp.

Male, 14 mm. Head and thorax reddish-fuscous, posterior edge of thorax silvery-white, patagia silvery-white. Palpi ochreous, ringed with reddish-fuscous. Antennæ reddish, spotted with white. Legs ochreous-whitish, anterior pair banded above with reddish-fuscous. Abdomen ochreous. Forewings elongate, moderate, costa gently arched, apex somewhat pointed, termen nearly straight, oblique; yellowish-ochreous, suffusedly streaked throughout with purplish fuscous, more reddish towards termen; costa narrowly yellowish throughout, obliquely strigulated with fine purplish lines; a fuscous dot at base of costa; 3 silvery-white, reddish-edged spots; first moderate, in disc before before middle; second similar, obliquely below and beyond; third elongate, moderate, larger transverse, at two-thirds from base, but not nearly reaching margins; a transverse row of small silvery-white, reddish-edged spots before termen, one above middle larger; a reddish purple line

along termen; cilia yellowish, at base orange-tinted. Hindwings grey-whitish; cilia whitish, yellowish on basal half.

Closely allied to *asteropa*, Lower, but differs especially in shape of forewing and color of hindwings besides other details.

Cooktown and Townsville, Queensland; four specimens, in November.

EULECHRIA LEUCOPIS, n. sp.

Male, 25 mm. Head, thorax, palpi, antennæ, and legs white. Abdomen ochreous-fuscous, densely clothed with whitish, leaving segmental margins prominent. Forewings elongate, rather broad, costa gently arched, termen obliquely rounded; white, faintly ochreous tinged; cilia white. Hindwings with 3 and 4 from a point; pale whitish-ochreous; cilia pale whitish-ochreous.

Differs from the other similarly colored species by the pale whitish-ochreous hindwings.

Broken Hill, New South Wales; three specimens, in November.

EULECHRIA LEPTOMERA, Lower.

(Proc. Linn. Soc., N.S.W., p. 412, 1900.)

In addition to the characters given, the antennal ciliations are 1, and veins 3 and 4 of hindwings are widely remote, equidistant with 5.

Mr. G. Lyell, jun., has bred the species from *Eucalyptus*, *sp.*

TRACHYNTIS TETRASPORA, Lower.

(*Philobota* (?) *tetraspora*, Lower, Proc. Linn. Soc., N.S.W., p. 413, 1900.)

Having received further specimens, including the male, I am able to place this species in its correct genus.

PHILOBOTA TRIMERIS, n. sp.

Male, 18 mm. Head orange, palpi yellowish (imperfect). Legs fuscous, anterior and middle tibiæ yellowish, anterior legs orange-yellow. Thorax and abdomen blackish. Forewings elongate, moderate, rather narrow, costa gently arched, termen oblique, hardly rounded; yellow, markings dark fuscous; a moderate rather thick streak along costa from base to three-fourths, attenuated at extremities and leaving extreme costal edge yellowish in middle; a similar streak along inner margin from base to near anal angle; an oblique streak from costa before apex direct to posterior extremity of last-mentioned streak, somewhat constricted below middle; cilia fuscous-yellowish, with a dark fuscous basal line. Hindwings bright

orange, upper half of wing dark fuscous; the fuscous color extends as a thick streak along termen towards anal angle; cilia fuscous, around anal angle yellowish.

Betweenl *auriceps*, Butl., *chrysanthes*, Turn., differing from both by orange hindwings. A similar peculiarity is noticeable in Western Australian *Cæsyra crocinastis*, Meyr.

Port Victor, South Australia; one specimen received from Messrs. S. and F. Angel, taken in March.

ATHEROPLA SCIOXANTHA, n. sp.

Male, 15 mm. Head orange-yellow. Palpi ochreous, second joint beneath fuscous. Thorax, antennæ, and abdomen dark fuscous, antennæ annulated with ochreous-white, anal tuft ochreous. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; pale yellow; markings fuscous; a moderate, thick streak along costa from base to middle, sometimes continued to apex; a well-marked spot on lower edge of streak at one-third; a short suffused streak from base along inner margin, curved up so as to almost touch last-mentioned spot; a moderate spot at posterior extremity of cell, beneath which is a fuscous suffusion extending to anal angle, and there meeting a thick fuscous shade along termen; cilia yellow, with 2 or 3 fuscous teeth at base, becoming wholly fuscous at anal angle. Hindwings pale ochreous; cilia dark fuscous.

Differs from the other species by the dark thorax, yellow hindwings, and cilia.

Stawell and Birchip, Victoria; two specimens, in November.

MIMOBRACHYOMA, n. g.

Head smooth, antennæ thickened, dentate, very shortly ciliated (¼), basal joint moderate, without pecten, or with one or two hair scales. Palpi smooth, moderate, second joint hardly reaching base of antennæ, terminal joint shorter than second, recurved. Thorax smooth. Abdomen rather dilated. Posterior tibiæ clothed with long fine hairs above. Forewings with vein 7 to apex, 2 and 3 stalked, from angle. Hindwings with 3 and 4 from a point, almost stalked in one specimen, cilia one-third.

Allied to *Sphyrelata*, Meyr., differing principally by the stalking of veins 2 and 3 of forewings. The genus is formed for the reception of *eusema*, Lower (Proc. Linn. Soc., N.S.W., p. 413, 1900); an insect much resembling *Sphyrelata* (?) *ochrophæa*, Meyr. Mr. Meyrick, in describing that species, surmised that probably a new genus would be required to receive it, and should *eusema* prove to be a geographical form of *ochro-*

phœa no confusion need arise, as the genus, which is necessary, will stand for that species. I have several specimens before me in perfect condition; one has a fugitive pecten, so that too much stress should not be laid upon that character.

MIMOBRACHYOMA EUSEMA, Lower.

(*Œcophora eusema*, Lower, P. Lin. Soc., N.S.W., p. 413, 1900.)

OCYSTOLA TEPHRODES, n. sp.

Male, 16 mm. Head whitish. Thorax, palpi, and antennæ fuscous, palpi internally white, terminal joint two-thirds of second, antennal ciliations 5. Legs fuscous-whitish, posterior pair whitish. Abdomen greyish-fuscous. Forewings elongate, rather narrow, costa gently arched, apex acute, termen very oblique; white, thickly irrorated with fuscous-grey, so as to appear ashy-grey-whitish, more pronounced on dorsal half; a narrow fuscous line from costa near base, to costa again at one-third; a moderate, thick black streak along fold, from base to anal angle, extremities pointed; a fine longitudinal line above posterior two-thirds of first streak, and continued slightly beyond its extremity; some dark fuscous scales along apical fourth of costa and termen throughout; cilia whitish; mixed with some fine blackish scales. Hindwings rather broadly-lanceolate; 3 and 4 somewhat remote; pale fuscous; cilia greyish-ochreous.

Stawell, Victoria; one specimen, in November.

OCYSTOLA MICROPHANES, n. sp.

Male, 15 mm. Head, thorax, and antennæ white, posterior two-thirds of antennæ fuscous-tinged, ciliations 5, patagia fuscous, palpi broken. Legs fuscous-whitish. Abdomen greyish-ochreous. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen oblique; snow-white, markings black; an irregular streak of scales along fold, from base to just before middle; a narrower and more clearly defined streak immediately above, commencing at about posterior extremity of first streak, and terminating before termen, somewhat dot-like at posterior extremity; a fine line of suffused blackish scales along termen and apical fourth of costa; cilia white, terminal fourth blackish, except at anal angle. Hindwings elongate-lanceolate; 3 and 4 remote; pale fuscous; cilia greyish-ochreous.

Allied to the preceding, but separated by the white forewings, dark patagia, and other details.

Stawell, Victoria; one specimen, in November.

Guestia adelphodes, Lower.

(*Eulechria adelphodes*, Lower, Trans. Roy. Soc., S.A., p. 178, 1893.)

The stalking of veins 2 and 3 of forewings and other characters of *Guestia* agree so well with this species that I remove it from *Eulechria*.

Mr. G. Lyell has sent me specimens from Gisborne, Victoria, taken in April.

ARDOZYGA, n. g.

Head smooth, side tufts moderate, loosely appressed. Antennæ serrate, evenly ciliated, nearly 1, without pecten. Palpi moderate, second joint not reaching base of antennæ, anteriorly with appressed scales, terminal joint shorter than second. Thorax smooth. Posterior tibiæ with long fine hairs. Forewings moderate, elongate, 7 and 8 stalked, 7 to costa, 2 and 3 fused to a point at base, from lower angle of cell; 3 and 4 sometimes connate. Hindwings nearly 1, 3 and 4 connate or very short-stalked; cilia two-thirds.

This genus is formed to receive the two following species. It differs from *Guestia*, Meyr., by the absence of pecten and veins 2 and 3 not rising on a curved stalk. From *Acompsia*, Hb., by the absence of pecten and fusing of veins 2 and 3 of forewings.

Ardozyga tetralychna, n. sp.

Male, 16 mm. Head, palpi, thorax, and antennæ dark fuscous, palpi internally whitish, apex of joint ochreous. Forewings elongate, moderate, costa gently arched, termen rather strongly oblique; dark fuscous, with some scattered darker fuscous dots, not forming definite markings; a small, well-defined orange red basal spot; a similar spot on inner margin just beyond base; a row of more or less connected suffused blackish spots along termen and apical fourth of costa; cilia greyish, with fuscous subbasal and subterminal lines. Hindwings light fuscous-grey; cilia grey-whitish, with two faint fuscous lines. Although an obscure-looking insect, it may be at once recognised by the orange basal spots, which, though small, are conspicuous.

Stawell, Victoria; two specimens, in November. I have seen a specimen from Birchip, Victoria.

Ardozyga thermoplaca, n. sp.

Male, 16 mm. Head, thorax, antennæ, abdomen, and legs dark fuscous, face somewhat ochreous, antennæ without pecten, ciliations 1, anal tuft ochreous, posterior legs mixed with

ochreous. Palpi ochreous, terminal joint shorter than second. Forewings elongate, moderate, costa gently arched, termen gently rounded, oblique; dark fuscous; a well-defined orange spot near base; a small white spot beyond and below; an irregular somewhat inwardly curved transverse series of three white spots, hardly forming a fascia, from costa at about one-third, reaching to fold before middle; a moderately large round white spot in middle at two-thirds from base, containing two fine black dots; some white scales along termen; a row of suffused alternate black and yellow spots on costa, commencing at transverse series of white spots, continued along costa to costal cilia, thence continued along termen to anal angle, less defined along termen; cilia yellow, more or less mixed and chequered with blackish. Hindwings yellow, basal and costal areas broadly blackish; cilia yellowish-ochreous.

Allied to the preceding, but easily separated by the bicolored hindwings.

Stawell, Victoria; three specimens, in November.

Saropla paracyla, Lower.

(*Plutella paracyla*, Lower, P.L.S., N.S.W., p. 24, 1897.)

I refer this species to *Saropla*, Meyr. I was inclined to form a new genus on the strength of the peculiarity of veins 2 and 3 of forewings, which in some specimens are short-stalked; in other from a point, and often separate; but these perplexing varieties preclude this. It will be necessary to widen the characters of that genus as above to receive it. The terminal joint of the palpi is erect.

Pleurota lomographa, n. sp.

Male, 15 mm. Head and palpi orange, head with a median transverse fuscous streak, second joint of palpi fuscous below. Thorax, antennæ, legs and abdomen blackish, patagia orange. Forewings elongate, moderate, costa gently arched, termen straight, very oblique; bright orange-yellow; a short blackish spot on costa at base; a moderately broad blackish streak along inner margin, from base to five-sixths, cilia orange, terminal half fuscous. Hindwings blackish-fuscous; cilia fuscous. Underside of both wings blackish.

Nearest *chlorochyta*, Meyr., but differs in color of hindwings and single streak along inner margin.

Goolwa, South Australia; one specimen, in November.

Pedois anthracias, n. sp.

Female, 20 mm. Head, palpi, and thorax blackish, anterior legs fleshy-pink, tarsi banded with fuscous, median and posterior legs whitish. Abdomen greyish-fuscous. Forewings elongate, moderate, costa strongly arched, termen obliquely rounded; 6 to apex; blackish; all veins obscurely outlined with black; extreme costal edge fleshy-ochreous; cilia greyish-fuscous, basal half fleshy-fuscous, mixed with some black scales. Hindwings greyish, faintly fuscous-tinged; cilia greyish, with a fuscous basal line.

Stawell, Victoria; two specimens, in November.

TINEIDÆ.

Iphierga pycnozona, n. sp.

Male, 14 mm. Head and palpi orange-yellow, palpi strongly tufted. Antennæ greyish. Thorax dark fuscous, patagia greyish. Abdomen greyish-ochreous. Legs greyish, anterior pair fuscous, anterior tibiæ fuscous, banded with greyish. Forewings elongate, costa gently arched, termen obliquely rounded; 4 absent; 9 and 10 stalked; pale ochreous, with blackish markings; four moderately straight transverse, irregularly edged fasciæ; first subbasal; second from one-fourth costa to one-fourth inner margin, sometimes interrupted below middle, and not quite reaching inner margin; third from costa before three-fourths to inner margin at two-fifths, with a short obtuse angulation in middle; fourth subterminal, from just before apex to above anal angle; a small spot on costa between third and fourth fasciæ; cilia pale ochreous. Hindwings and cilia pale ochreous.

Allied to *stasiodes*, Meyr., but apart from the difference in neuration it may be separated by the subterminal fascia. The peculiarity in neuration is specific only.

Mackay, Queensland; two specimens in November.

Iphierga melichrysa, n. sp.

Male, 12 mm. Head and palpi orange-yellow, palpi strongly tufted. Thorax and abdomen dark fuscous, patagia fuscous, antennæ greyish-fuscous. Legs fuscous, posterior coxæ ochreous. Forewings elongate, moderate, costa gently arched, termen obliquely rounded; 4 absent; ochreous, with black markings; a narrow basal fascia, outer edge straight; three narrow, moderately straight, irregularly-edged transverse fasciæ; first from one-fourth of costa to one-fourth inner mar-

gin, widely interrupted in middle; second from two-thirds costa to two-thirds inner margin, with an acute projection above middle, sometimes interrupted above and below this; a fine dot on costa beyond; third thick, from costa before apex to anal angle, parallel to termen, and with one or two projections on posterior edge; cilia pale ochreous. Hindwings light fuscous; cilia ochreous-fuscous.

Also allied to *stasiodes*, Meyr., but separated by the basal patch, third fascia, and darker hindwings.

Birchip, Victoria; two specimens received from Mr. D. Goudie, taken in November.

Descriptions of New Australian Geometrina, &c.

By Oswald B. Lower, F.E.S., Lond., &c.

[Read September 2, 1902.]

GEOMETRINA.

HYDRIOMENIADÆ.

Hydriomena actinipha, n. sp.

Female, 24 mm. Head, palpi, antennæ, thorax, and legs fuscous-whitish thorax with a faint fuscous anterior band. Abdomen greyish-ochreous. Forewings elongate-triangular, termen waved, obliquely rounded; ochreous-whitish, markings fuscous, well defined, anterior edge of basal patch gently curved, and finely edged posteriorly by a narrorw streak of whitish throughout, from one-fifth costa to one-fourth inner margin; a fine transverse line of fuscous in middle of patch; median band broad on upper half, finely edged on either side with streak of white, anterior edge from one-third costa to beyond one-third inner margin, strongly indented below middle and with a short projection below costa, posterior edge from beyond two-thirds of costa to two-thirds inner margin, with a strong acute projection in middle; ground color between basal patch and median band and subterminal line sometimes wholly pale ochreous; a black discal dot in middle of median band; subterminal waved, irregular, whitish, anteriorly edged with fuscous; a sharply defined oblique white streak from apex to subterminal below costa; a fine waved black line along termen; cilia whitish, barred with fuscous. Hindwings with termen waved; grey-whitish; median patch faintly indicated in fuscous; subterminal and line along termen as in forewings; cilia as in forewings.

Nearest *cryeropa*, Meyr.

Broken Hill, New South Wales; two specimens, in March.

STERRHIDÆ.

Eois stenozona, n. sp.

Female, 24 mm. Head, palpi, antennæ, and thorax whitish, face blackish, collar light ferruginous. Legs ochreous-whitish. Abdomen grey-whitish. Forewings elongate-trian-

gular, termen oblique, nearly straight; whitish, minutely irrorated with fuscous; all lines except subterminal absent; subterminal strongly waved throughout, black, from costa at five-sixths to inner margin before anal angle, somewhat curved inwards above middle; a row of small fuscous dots along termen; cilia whitish. Hindwings with termen rounded; color, line, dots along termen, and cilia as in forewings; a faint fuscous discal dot.

Recognised by the absence of anterior lines.

Broken Hill, New South Wales; one specimen, in September.

Eois oenopus, n. sp.

Male and female, 12-14 mm. Head, palpi, antennæ, thorax, and abdomen dull whitish-ochreous tinged with greenish, face fuscous, antennal ciliations nearly 1½. Legs whitish-ochreous, posterior tibia in male with tuft of long purplish and whitish hairs. Forewings elongate-triangular, termen obliquely rounded; pale ochreous-whitish, somewhat greenish tinged; lines pale fuscous, waved; first nearly straight; median thicker, somewhat angulated above middle; second nearly straight, subterminal and submarginal obscure; a fine black discal dot above middle resting on posterior edge of median line; cilia ochreous-white. Hindwings with termen rounded; 6 and 7 stalked; color and markings as in forewings, but discal dot placed midway between first and median lines.

A distinct species, the male being recognised by the purplish tuft of hairs of hind tibiæ.

Cooktown, Queensland; four specimens in November.

Eois polygramma, n. sp.

Female, 12 mm. Head, antennæ, thorax, and abdomen white, face and palpi fuscous. Legs fuscous, posterior pair whitish. Forewings elongate-triangular, termen not waved, obliquely rounded; white, with ochreous markings; a narrow streak along costa from close to base to apex; lines strongly waved, well defined; first indented below middle; a fine black discal dot above middle just anterior to median line; median, second, and subterminal, similar and equidistant, and with faint double projection in middle; submarginal narrow; an interrupted fuscous line along termen; cilia greyish-ochreous. Hindwings with termen hardly rounded; 6 and 7 stalked; absent; line along termen and cilia as in forewings. Underside color, lines, and discal dot as in forewings, but first line of all wings pearly-white without markings.

A neatly marked species; a peculiarity is the absence of all markings of underside of wings.

Cooktown, Queensland; one specimen, in November.

LEPTOMERIS TETRASTICHA, n. sp.

Male, 24 mm. Head, antennæ, thorax, and abdomen dull whitish, antennal ciliations 1. Palpi dark fuscous. Legs whitish (posterior pair broken). Forewings elongate-triangular, termen obliquely rounded, hardly waved; white; lines slender, fuscous; first and median faintly developed; a fuscous discal dot in middle; second, subterminal, and submarginal strongly waved, dot-like, parallel and equidistant; a row of black dots along termen; cilia fuscous, with a paler line at base. Hindwings with termen rounded; 6 and 7 stalked; color, lines, discal dot and dots along termen as in forewings; cilia as in forewings.

A curious species, characterised by the arrarngement of the three posterior lines.

Derby, Western Australia; one specimen, in November.

PYLARGE EREBOSPILA, n. sp.

Male, 20 mm. Head, palpi, antennæ, thorax, and legs dull ochreous, palpi long, infuscated on sides. Abdomen dull whitish. Forewings elongate-triangular, termen faintly waved, somewhat prominent in middle; dull ochreous; all lines obsolete; costa with irregularly scattered fuscous dots on posterior two-thirds; markings fuscous; a spot in disc at one-third from base; a second, larger, in middle of wings; indications of a transverse row of small dots, indicating submarginal line; two spots before termen on upper portion of wing; a row of small spots along termen; cilia dull ochreous, paler at base. Hindwings with termen as in forewings; 6 and 7 from a point; color, first discal dot and submarginal dots as in forewings, but the latter more pronounced, especially on lower half; dots along termen and cilia as in forewings.

A peculiar-looking insect not unlike some species of *Noctuina*.

Cooktown, Queensland; one specimen, in November.

SELIDOSEMIDÆ.

SMYRIODES APHRONESA, n. sp.

Male and female, 38-42 mm. Head, palpi, antennæ, and thorax ashy-grey, antennal pectinations 4. Legs ashy-grey, posterior pair grey-whitish. Abdomen greyish. Forewings

elongate-triangular, costa gently arched ,termen obliquely rounded, somewhat waved; cinereous-fuscous mixed with whitish posteriorly; lines blackish; first from one-fourth costa to one-fourth inner margin, angulated above and below middle; second from four-fifths costa to three-fourths inner margin, with a long fine projection outwards and a faint angulation immediately above inner margin; median shade rather narrow, distinct, blackish, similar in shape to previous line, subterminal nearly straight, whitish, obscure; all veins more or less outlined with blackish, more pronounced towards termen; 2 short blackish streaks beforer termen above middle and two similar below; a fine black line along termen; cilia cinereous-fuscous, with black points at extremities of veins. Hindwings with termen waved on upper half, more strongly in male; whitish, irrorated with fine blackish scales; a moderately broad blackish band along termen, narrowed towards anal angle; a fuscous discal dot; a black line along termen; cilia whitish, with blackish points at extremities of veins.

Nearest *heterochaës*, Lower, but differs by the different-shaped lines and especially the shorter antennal pectinations. The male has the lines more obscure.

Birchip, Victoria; one specimen, in April.

TORTRICINA.

Cacæcia ophiodesma, n. sp.

Male, 30 mm. Head and thorax dark ochreous. Palpi, antennæ and, legs ochreous, palpi long, fuscous-tinged above. Antennæ strongly ciliated. Abdomen greyish. Forewings elongate, moderate, costa moderately arched on basal half, termen nearly straight, slightly oblique, costal fold inconspicuous; pale ochreous, with fuscous markings; a small spot on fold at one-sixth from base; a thick, strongly outwardly oblique fuscous fascia, from costa before middle to inner margin at two-thirds, indented in middle on anterior edge, and with an evenly curved sinuation on upper half posteriorly; a moderate cuneiform spot on costa at about five-sixths; some scattered dots towards termen; cilia pale ochreous. Hindwings with termen faintly sinuate beneath apex; 6 and 7 stalked; pale ochreous, greyish towards base, spotted with pale fuscous, more pronounced beneath; cilia pale ochreous.

Not near any other described Australian species; the stalking of veins 6 and 7 and inconspicuous fold of forewings are specific only.

Sheffield, Tasmania; one specimen, in November. (Coll. *Lyell.*)

DICHELIA DIPHTHEROIDES, n. sp.

Male, 12 mm. Head and thorax reddish-ochreous. Palpi and antennæ greyish-ochreous. Abdomen blackish above, whitish beneath Legs whitish-ochreous, posterior and middle pair infuscated Forewings elongate, moderate, costa gently arched on basal half, termen nearly straight, oblique; reddish-ochreous, crossed by numerous irregular narrow transverse fuscous lines, most prominent on posterior half, one from just before middle of costa to beyond middle of inner margin, and another similar from just before three-fourths of costa to anal angle, both streaky gently curved outwards; a narrow fuscous streak from apex to termen towards anal angle; costa shortly spotted throughout with fuscous, from which spots most of the streaks commence; cilia reddish-ochreous, basal half fuscous. Hindwings fuscous, indistinctly spotted with darker; cilia light fuscous.

Birchip, Victorira; one specimen, in April.

TORTRIX ASTHENOPIS, n. sp.

Male, 16 mm. Head, palpi, thorax, and antennæ dull fuscous-reddish. Abdomen dark fuscous, anal tuft ochreous. Legs fuscous-whitish, posterior pair whitish, coxæ infuscated. Forewings elongate, moderate, costa rather strongly arched, termen hardly rounded, oblique; dull reddish-fuscous; costal edge narrowly fuscous throughout; a moderate dull white supra-median streak, dilated on posterior half, from base to apex, edged obscurely above throughout with a narrow streak of fuscous, and edged below from middle to posterior extremity by a similar streak, thickest on posterior half; a moderate thick irregular dull whitish longitudinal streak from base in middle to anal angle, slightly curved up in middle and edged above throughout with a moderate dull fuscous streak, thickest on posterior half; cilia dull reddish-fuscous, with a pale basal line. Hindwings pale fuscous-whitish, very faintly spotted with darker; cilia greyish, with a darker subbasal line.

In the neighborhood of *aulacana*, Meyr.

Melbourne, Victoria; one specimen.

TORTRIX PAUROZONA, n. sp.

Male, 16 mm. Head and palpi ochreous-white, post orbital rims fuscous, palpi fuscous at apex of second joint. Thorax fuscous, patagia ochreous-white. Abdomen fuscous, ochreous-whitish beneath. Legs ochreous-whitish, fuscous tinged. Forewings elongate, moderate, costa hardly arched, termen nearly straight, oblique; deep brownish-ochreous, with

ochreous-whitish markings; a moderately short inwardly oblique narrow transverse subcostal fascia, not reaching either margin, indicating outer edge of basal patch; two parallel, oblique narrow fasciæ, from inner margin before and beyond middle, reaching two-thirds across wing; a short fascia from apex of second streak to inner margin at three-fourths; a similar fascia from just beneath costa before apex to termen above anal angle; 3 or 4 spots on costa between one-third and apex; a small spot on termen below apex; cilia fuscous, mixed with ochreous-white. Hindwings dark fuscous, strigulated and spotted with yellowish, and with a streak of yellow above anal angle; cilia ochreous, with a dark fuscous basal line.

A peculiarly marked species, which I at first regarded as an extreme variety of *subfurcatana*, Walk., but the different arrangement and direction of markings of forewings and color of hindwings separate it. The markings of *both* wings are reproduced on underside.

Blackwood, South Australia; one specimen, in November.

LEPTARTHRA, n. g.

Head smooth, palpi small, porrected, second joint rather rough scaled, terminal joint short. Antennæ biserrate, very shortly ciliated. Forewings moderate, costa in male simple, costa gently arched, termen faintly sinuate beneath apex; vein 1 furcate towards base; 7 and 8 rarely stalked; 3 from angle. Hindwings with 3 and 4 connate; 5 widely remote, parallel to 4; 6 and 7 separate.

Somewhat allied to *Byrsoptera*, Lower, but differs by the smooth thorax, absence of secondary cell, and costa of hindwings.

The stalking of veins 7 and 8 of forewings is a curious form of variation; it is noticeable in one specimen only.

LEPTARTHRA AULACODES, n. sp.

Male, 12-14 mm. Head and palpi ochreous. Antennæ and thorax fuscous, patagia light fuscous. Abdomen dark fuscous. Legs whitish-ochreous, posterior tibiæ infuscated, tarsi ringed with fuscous. Forewings elongate, moderate, costa gently arched, termen rounded, oblique, faintly sinuate beneath apex; deep reddish-ferruginous, mixed with blackish; basal area mixed with some bluish-metallic scales; two pairs of transverse, somewhat waved, outwards curved bluish-metallic fasciæ; first from before middle, second beyond middle, each pair becoming confluent on inner margin, interspaces between fasciæ filled in with dark fuscous; ante-

rior pair edged anteriorly throughout with dark fuscous; a bluish-metallic fascia, furcate on costa, from costa before apex, thence curved around before termen, and meeting previous fascia above inner margin; costa spotted with ochreous; costal portion of metallic markings ochreous; veins towards termen outlined with black; a fine black line along termen; cilia fuscous. Hindwings dark bronzy-fuscous; cilia ochreous, basal half dark fuscous.

Derby, Western Australia; two specimens, in September.

DIPTERINA GNOPHODRYAS, n. sp.

Male, 16 mm. Head, thorax, palpi, antennæ, and abdomen dark fuscous. Legs fuscous, posterior pair ochreous. Forewings elongate, moderate, costa gently arched, termen nearly straight, oblique; dull ochreous-whitish; costa spotted with fuscous throughout; two spots at three-fourths more distinct; basal patch fuscous mixed with some yellowish-ferruginous scales; outer edge limited by a blackish line, from one-fifth costa to one-fifth inner margin, strongly curved outwardly, and with a rounded projection in middle; median fascia narrow, fuscous, from costa at about two-thirds to inner margin before middle, lower half much attenuated and becoming yellowish-ferruginous; two or three narrow, transverse yellowish-ferruginous streaks between basal patch and fascia, not reaching costa, one sometimes connected with outer edge of basal patch in middle and becoming fuscous; two or three irregular transverse yellowish-ferruginous streaks be- dull fuscous, obscure somewhat quadrate spot at anal angle; an irregular triangular fuscous patch just before middle of termen, containing some blackish spots on edges; some scattered blackish spots along termen; cilia ochreous-grey, base fuscous. Hindwings light fuscous, obscurely spotted with darker; cilia light fuscous, with a darker subbasal line.

Hobart, Tasmania; one specimen, in November.

Descriptions of New Species of Corals from the Australian Tertiaries.

By J. Dennant, F.G.S.

PART V.

Plates V. and VI.

[Read October 21, 1902]

The corals next described, though somewhat aberrant from the type species in regard to their costæ, should, I think, be placed under Milne-Edwards and Haime's genus Platytrochus. They are much compressed, and the longitudinal axial fossa contains a series of papilli, free superiorly, which might be mistaken for pali only that they are too irregularly placed, and, moreover, vary in number in separate individuals of the same species. These papilli not only occupy the fossa proper, but tend to spread beyond, especially in the lateral portions of the calice. They constitute the superior extension of the columella, which, lower down, is formed by the fusion across the central fossa of processes from the margins of the principal septa.

The several authors who have described species of Platytrochus from Alabama, the type locality, are not agreed concerning the structure of the columella. Edwards and Haime describe it as essential, fascicular, and terminated by a papillose surface*. De Gregorio, in describing *P. Claibornensis*, says that the columella is false, irregular, and formed of the pali.† Duncan, who diagnoses the genus, remarks:—"The columella is essential, elongate, and fascicular, and has a free papillary edge. * * * There is a lamellar, fascicular columella." ‡ Finally, Vaughan, who discusses the genus at length in his admirable monograph of the Eocene and Lower Oligocene Coral Faunas of the United States, sums up his conclusions thus:—"Columella false, formed by the fusion of lobes from the inner margins of the septa, or by the fusion across the axial space of the inner margins of the septa." §

* Annales sci. nat., 3rd ser., vol. IX., p. 247.
† Mon. de la Faune Eocénique de l'Ala., p. 255.
‡ Revision of Madreporaria, p. 18.
§ Monographs of the U.S. Geological Survey, vol. XXXIX., pp. 73-4, Washington, 1900.

In regard to the Australian representatives of the genus, I remark that the inner margins of the septa for some distance in the fossa are free, and not fused with the papilli. This is plainly seen in recent examples, as well as in well preserved fossil ones. In a transverse section of a corallum the columella below its papillose surface presents a fascicular appearance, which is due no doubt to its having been formed by the fusion across the axial space of successive growths from the septal margins. In vertical section across the shorter diameter of the coral the columella shows as an irregular pillar, with lateral nodular offshoots to the adjoining septa on either side. A columella constructed on such a plan may, I think, be termed essential.

The species from Alabama described by Edwards and Haime have two kinds of costæ. Those on the middle of the broad surfaces of the corallum enlarge towards the calice, and those on the edges near the base are extended and large. A deviation from the type species in regard to both the costæ and septa was admitted by de Gregorio, who says concerning *P. Claibornensis*:—"This species differs from the two preceding (*P. Stokesii* and *P. Goldfussi*) on account of its much more numerous, narrower, and less regular costæ and septa."* Now, the Australian species show further that the contrast alluded to by Edwards and Haime between the costæ on the edges and those on the flat surfaces cannot be regarded as of generic value. Of the four species of Platytrochus here described, one (*P. vacuus*, Ten. Woods), exemplifies the Alabama type of costæ (pl. v., fig. 4a), but the three others either have the costæ of the edges and sides much alike, or the distinction is trifling. Still, the calicular plan is the same, and in other respects also they are so closely allied to that species that they must be included with it in the genus.

In all, six species of Platytrochus are known in Australia, viz., one both fossil and recent, four fossil only, and one recent only.

Platytrochus Airensis, *spec. nov.*

Pl. v., figs. 1*a*, *b*.

Corallum free, compressed, and wedge-shaped, with the edges slightly sloping from the calice downwards, but contracting suddenly near the base, and then tapering to a point (in the corallum figured the extreme point is broken off). Calice shallow and elliptical, with its major and minor axes in the

* Loc. cit.

ratio of 3 to 2. Septa exsert, highly granular, and in six unequal systems, the central ones being smaller than those at the ends. The former contain three cycles of septa only, while in the latter a fourth cycle is fully developed, and the total number of septa in the calice is thus 40. The primaries are conspicuously longer and broader than the rest, which are subequal.

The central fossa is long, wide, and shallow, and is bounded by the free margins of the septa. The columella is formed by the fusion of processes from the principal septa in the manner already described. The papilli on its surface are irregular in shape, numerous, and spreading, especially in the lateral boundaries of the fossa.

The wall is stout, and the costæ, which are continuations of the septa, are prominent and ornamented with transversely elongated granules. Those on the flat surfaces of the corallum are broadest at the calicular margin, and gradually taper downwards, while those on the edges contract medially, but again expand as they approach the base. In some examples, probably aged ones, the costæ on the edges are distinctly broader than those on the flat surfaces, but usually the difference is so slight as to be easily overlooked. The two lateral primaries are curved, and follow the contour of the corallum from the calicular margin to the pointed base. The remaining costæ are straighter, and almost parallel with each other. The several orders are nearly or quite free to their basal terminations, with the exception of the more central pair of quaternaries in each end system, which fuse with the enclosed tertiary at a half to two-thirds from the margin of the calice.

Height of corallum, 8.5 mm.; length of calice, 6 mm.; breadth of calice, 4 mm.

Locality, &c.—Fairly abundant in Eocene strata at Wilkinson's No. 4 Aire coastal section and at Spring Creek, near Geelong. The type is from the former locality.

Platytrochus hastatus, *spec.* nov.

Pl. v., figs. 2*a*, *b*.

This species is smaller and more slender than the preceding, and has a prolonged, spear-shaped base. The costæ also are smooth, and rarely there is a shining, but very faint epitheca partially covering them. In typical examples the costæ of the edges and flat surfaces differ very little in size, but the former tend to become broader with age, and then the coral approximates in outline to *P. vacuus*, T. Woods, see *post*, which is, however, a more compressed form.

The septa and columella closely resemble the same structures in *P. Airensis*, and do not call for separate description.

The columella figured is 7.5 mm. high and the diameters of its calice are respectively 3.75 mm. and 2.5 mm. The calice chosen as type belongs to a larger example, and its diameters are 4.5 mm. and 3 mm. Its corallum is diminished by having the pointed end broken off, but still measures 8 mm. in height.

Locality, &c.—In Eocene strata at Muddy Creek, Spring Creek, Shelford, and on the banks of the Aire River at Fishing Point.

This species is also recent, and was dredged in Backstairs Passage, at the entrance to St. Vincent's Gulf, by Dr. Verco, who has handed me his examples (7) for examination.

Platytrochus curvatus, *spec. nov*

Pl. v., figs. 3*a*, *b*.

With the exception of its curved outline, the corallum of this species much resembles that of *P. hastatus*, but is generally narrower. It has a similar spear-pointed base, and the costæ are also smooth and delicate. An epitheca is, however, much commoner. In many specimens it is almost complete, and fairly dense, the costæ being visible only at the margin of the calice. In others it is partial and in transverse, irregular bands, while again some, like the type, show no trace of epitheca.

The development of the septa is less regular than in the two species just described. For example, in the type one of the end systems contains the same number of cycles as the central pair, viz., three, while in each of the other end systems there are in addition some septa of the fourth order; moreover, in this example one of the lateral primaries bends away from the line of the long axis of the calice.

The papilli of the columella resemble those of the other species of the genus. In the calice figured they are exceptionally large and few in number.

Height of corallum, 7 mm.; diameters of calice, 3 mm. and 2 mm.

Locality, &c.—Abundant in the Eocene of Muddy Creek, Spring Creek, and Shelford; less so at Curlewis, Moorabool Valley (Fyan's Ford), Wilkinson's No. 4 section, and Fishing Point.

A coral from Muddy Creek described and figured by Ten. Woods under the name of *Smilotrochus vacuus* long puzzled collectors, the alleged absence of a columella leading them off

the track. His species was evidently described from a young example, in which the columella was partially at least worn away by fossilization. He subsequently discovered the remnants of a columella in the species, and then established a new genus, Koilotrochus, for its reception, in the diagnosis of which he remarks:—"Columella rudimentary confined to a few papillary projections at the base of the deep and wide calicular fossa." Some corals collected by Mr. T. S. Hall and myself, also from the Muddy Creek beds, are, I consider, adult examples of Woods' species, but they possess a conspicuous papillary columella, which, combined with other characteristics, places them in the genus Platytrochus. A few young immature individuals accompany the adult ones in our gatherings, which, in regard to the corallum, resemble Woods' figure. Their septa also are arranged on the same plan as in his illustration of the calice, but instead of a vacant central space there is the usual columella of the species. When describing the calice, Woods gives its diameters as 3 mm. and 1.5 mm. respectively, or in the ratio of 100 to 50, but in his enlarged drawing the ratio of the axes is as 100 to 66! The species name is certainly an unfortunate one, as it contradicts an essential characteristic of the coral, but in accordance with common usage must be retained.

I redescribe the coral from an adult well preserved example, and also supply illustrative drawings.

Platytrochus vacuus. *T. Woods* (sp.).

Pl. v., figs. 4*a*, *b*.

1877. *Smilotrochus vacuus*, T. Woods, Proc. Roy. Soc., New South Wales, vol. xi., p. 190, pl. ii., figs. 2, 2a.

1878. *Koilotrochus vacuus*, T. Woods, Proc. Linn. Soc., New South Wales, vol. ii., pp. 313-4.

Corallum small, wedge-shaped, and much compressed. The edges are nearly but not quite straight until inferiorly they bend at a sharp angle, and almost meet at the broadly pointed, projecting base. The flat surfaces slope uniformly downwards.

Calice sub-plane and elliptical with its major axis double the length of the minor. Septa slender, granulate, and in six systems, which show the same cyclical arrangement as in *P. Airensis*. They are subequal in the central systems; also subequal but generally smaller in the end systems, except the two extreme primaries, which are the most prominent septa in the calice. The papilli of the columella resemble those in the three other species described.

Costæ smooth: on the flat surfaces they converge from the calice downwards to the projection at the base, while on the edges they are doubly curved, first inwards and then outwards; the central costæ are almost uniform in size throughout, but those flanking the edges become very broad at their basal terminations. Of the more central costæ a few only reach the base and are joined at varying heights on the wall by the rest; those adjoining the edges are free. A faint shining epitheca is sometimes present, especially in young examples.

Height of corallum, 5.5 mm.; diameters of calice, 4 mm. and 2 mm.

Locality, &c.—Eocene, Muddy Creek. Collected from a remade bed (junction of Eocene and Miocene) at Forsyth's, Grange Burn, by Mr. T. S. Hall, and by myself in the lower beds. Rare.

Conocyathus scrobiculatus, *spec. nov.*

Pl. vi., figs. 1*a*, *b*.

Corallum small and conical, with rounded, costulate base. Calice circular. Septa laterally spined, and in six systems with three cycles. They vary in length according to order, the primaries being longest. The tertiaries are slighter than the other two orders, which are subequal in size. There is no columella, but six elongate and prominent pali surround the central axial space, and are placed before the secondary septa.

There are four complete cycles of costæ, of which only the first three have septa corresponding to them. Those of the fourth cycle are very thin, but well marked at the calicular margin as delicate projections from the wall in the spaces between the other costæ; they reach only from a quarter to a third from the margin. The three lower orders are less slender than the fourth, and after passing these they enlarge to twice their former size. The tertiaries again cease abruptly near the base, to which only the twelve primaries and secondaries extend, and after passing the tertiaries they in turn become still stouter than before. All the costæ are smooth and free, there being no union of orders on the wall. In most specimens there is a regular series of punctations or pores in each intercostal space, but in a few young individuals these are replaced by minute dimples or fossettes. Apparently, therefore, the wall wears gradually away where it is thinnest, perhaps during fossilization, and the result is that the intercostal spaces become fenestrated.

Height of corallum, 5 mm.; diameter of calice, 2.5 mm.

Locality, &c.—Fairly common in the Eocene of Muddy Creek, Spring Creek, Shelford, and Mitchell R.; less so at Birregurra, Corio Bay, and Moorabool Valley. The type is from Spring Creek.

This species is closely allied to the recent *C. Zelandiæ*, Duncan,* but the latter is generally larger, and, besides, shows no intercostal pores or dimples. The costæ are similarly arranged in both. Duncan says that there are in his species rudimentary septa corresponding to the fourth cycle of costæ, but I have not observed them. My specimens are not from New Zealand, but from Port Jackson, New South Wales, and were obligingly presented to me by Mr. C. Hedley.

C. cyclostatus, T. Woods'† a common Muddy Creek coral, differs from *C. scrobiculatus* in being larger, and compressed, with an elliptical calice. It exhibits also the same costal peculiarities.

Ceratotrochus exilis, *spec. nov.*

Pl. vi., figs. 2*a*, *b*.

Corallum small; slender, curved or nearly straight, and gradually tapering to the pedicellate base.

Wall thin and covered by a transversely ridged epitheca, which, by wearing, becomes pitted with longitudinal lines of minute pores between the mural borders of the septa.

Calice circular. The septa are thin, wavy, granular, and in six systems, with three cycles. The primaries and secondaries are frequently lobed at their central ends; they are equal in size, and the tertiaries are not much smaller. The columella consists of a few comparatively large and variously shaped papilli. There are seven of these in the type, but some examples show only three or four.

Height of corallum, 9 mm.; diameter of calice, 2.5 mm.

Locality, &c.—Eocene at Cape Otway, Wilkinson's No. 4 section, Brown's Creek, Hamilton Creek, Gellibrand River, Fishing Point, Spring Creek, Shelford, Corio Bay, Curlewis, Mornington, Lower Maude. Rare in all the sections except the first, which is the locality of the type.

This coral is distinguished from the allied form identified by Duncan as *C. typus*, Seguenza, *var. Australiensis* ‡ by its slender, regularly tapering outline. Its columella also contains fewer papilli, and the septal orders vary less in length.

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* Deep Sea and Littoral Corals. Proc. Zool. Soc. London, 1876, p. 431, pl. xxxviii., figs. 1-3.

† On some Australian Tertiary Corals. Roy. Soc. N.S.W., vol. IX., p. 188, pl. i., figs. 2, 2*a*.

‡ Australian Corals. Q.J.G.S., vol XXVI., pp. 298-9, pl. xix. fig. 8.

Ceratotrochus Halli, *spec. nov.*

Pl. vi., figs. 3*a*, *b*.

The corallum of the type is moderately tall, tapering, and cylindro-conical in shape, but my collection also contains short cylindrical corals similar in other respects and with calices of equal diameter. These are not more than a variety, and may even be young examples of the species. They retain the scar of former attachment, which in the longer, tapering coralla is frequently worn off. At the basal termination of the latter some orders of septa and an incipient columella are occasionally visible.

Calice sub-plane and almost circular, the ratio of the major and minor axes being as 100 to 93. In the short specimens the calice is rarely more elliptical. Septa stout, equal, and in six systems with three cycles. The primaries remain free till they reach the columella; the tertiaries bend towards and usually unite with the secondaries, which then generally, but not uniformly, become stouter. In the type the secondaries after their union with the tertiaries are exceptionally stout. All the septa are characteristically beset with long and stout spines, placed at right angles to their sides, and in rows parallel with their upper margins.

The columella is essential and fascicular, and consists of irregular processes, which, though connected with the first and second orders of septa, are independent structures. In one example the columella has nodules on its upper surface.

The wall is stout and covered by a strong epitheca. The costæ, which correspond with the septa, are represented by rounded elevations, broad at the summit, and gradually becoming smaller towards the base. They are crossed by a series of arched, slightly raised lines or ridges of epitheca, some of which are stronger than the rest.

Height of corallum, 9.5 mm.; diameters of calice, 3.75 mm. and 3.5 mm. The dimensions of the calice remain fairly constant in the examples, but the height varies from that given above for the type down to about 2 mm. in the variety mentioned.

Locality, &c.—Rare in the Eocene of Spring Creek, near Geelong. One example also from Brown's Creek, and another from Altona Bay.

The species name is in compliment to Mr. T. S. Hall, who has placed his interesting collection of tertiary corals at my service.

The next coral to be described I place in the genus Cyathosmilia, which was established in 1878 by Ten. Woods for the

reception of two species from Aldinga. His diagnosis of the genus is very brief, and reads thus:—"Simple pedicellate corals with endotheca and pali. No columella."* Woods is, however, mistaken in regard to the last statement, as there is a decided columella in his type species, *C. laticostata*. I collected many examples of this some years ago at the Aldinga section, and, though in some of them the columella is inconspicuous, being probably worn away by fossilization, it can in most calices be plainly discerned as a styliform process. The second species described by Woods, *C. tenuicostata*, belongs doubtfully to the genus. The diagnosis of the genus is corrected and amplified as follows:

GENUS CYATHOSMILIA, *T. Woods* (*emend.*).

Corallum curved or almost straight, and usually long, cylindrical or slightly compressed, and pedicellate. Calice circular or elliptical. Septa in six systems with three cycles. Pali in one crown. Columella essential and styliform. Costæ covered by a complete epitheca. Endotheca fairly developed.

Cyathosmilia velata, *spec. nov.*

Pl. vi., figs. 4*a*, *b*.

Corallum tall, horn-shaped, and usually slightly tapering to its pedicellate base, where the scar of former attachment is frequently preserved. The specimens are fairly uniform in shape, but a few are elliptical in transverse sections, while the majority are circular or nearly so. Occasionally the corallum bears just a perceptible crest at the outer edge of the curve. Calice of moderate depth and either circular (as in type) or slightly elliptical. The primary septa are rather longer than the secondaries, but otherwise equal; tertiaries much smaller. At the surface all are slender, especially the tertiaries, but the first two orders increase in thickness downwards. Pali six in number, elongate, and before the secondary septa. The columella is superiorly sometimes a single, sometimes a double style. It is generally connected with the pali by endotheca, which is fairly abundant in the central fossa. There is also more or less endotheca at the margin of the calice and between the septa. In the above description of the calicular structure the type and a younger specimen are especially indicated. My collection contains numerous individuals, but with the exception of these two, the upper fragile portion of the calice has been worn away.

* On some Fossil Corals from Aldinga. Phil. Soc., Sth. Austr., vol. I., p. 113.

Still, in many of them the structure of the septa, pali, &c., is easily made out.

The wall is thin and covered by a smooth epitheca, having wavy transverse lines and concentric folds. There are broad costæ corresponding to the first and second orders of septa, but they are barely traceable beneath the epitheca; the tertiary septa have no costæ corresponding to them. The intercostal spaces are usually marked by a double row of very fine pores, due to the wearing of the epitheca. As this wears still further the costæ and the pores between them become very conspicuous, until finally, by its complete removal, a skeleton of the coral is left, showing twelve strong costæ reaching from the pointed base to the margin of the calice, where they are continued as septa. Such skeleton coralla are very numerous at the chief locality, Brown's Creek.

The dimensions of the type, which is a good representative adult specimen, are:—Height of corallum, 17.5 mm.; diameter of calice, 4.5 mm.

Locality, &c.—Very abundant in Eocene strata at Brown's Creek; less so at Hamilton Creek and Wilkinson's No. 4 section, all of which are neighboring localities in the Cape Otway district of Victoria.

A comparison of this description of *C. velata* with that of *C. laticostata* by Ten. Woods shows that the two species are closely allied. The latter is more elliptical as to its calice as well as in transverse sections of the corallum. Its costæ also are more prominent, while the crested ridge on the outer edge of the curved corallum becomes a constant and distinctive feature.

EXPLANATION OF PLATES.

Plate V.

Fig.
1. *Platytrochus Airensis*—*a*, corallum, 4 diam.; *b*, calice, 6 diam.
2. *Platytrochus hastatus*—*a*, corallum, 4 diam.; *b*, calice of another example, 8 diam.
3. *Platytrochus curvatus*—*a*, corallum, 4 diam.; *b*, calice, 10 diam.
4. *Platytrochus vacuus*—*a*, corallum, 6 diam.; *b*, calice, 8 diam.

Plate VI.

1. *Conocyathus scrobiculatus*—*a*, corallum, 6 diam.; *b*, calice, 12 diam.
2. *Ceratotrochus exilis*—*a*, corallum, 3 diam.; *b*, calice, 12 diam.
3. *Ceratotrochus Halli*—*a*, corallum, 3·5 diam.; *b*, calice, 8 diam.
4. *Cyathosmilia velata*—*a*, corallum, 2 diam.; *b*, calice, 6 diam.

List of the Edible Fish of the Lower Murray.

By A. H. C. Zietz, F.L.S., C.M.Z.S., &c.

[Read October 21, 1902.]

In the following list I have enumerated all the fish which frequent the Lower Murray near its mouth, including Lakes Alexandrina and Albert. It often happens that the current is insufficient to keep the sea water out, which enters through the narrow channel at the mouth of the river, making the water brackish and uninhabitable for many fresh water species. These are then driven back a long way up the river, where the water remains fresh. It naturally follows that with the salt water many marine species find their way into the river. But I do not intend to deal with these occasional visitors in this list.

I have given the vernacular and scientific names of each species, and also, where it is known to me, the name in the language of the Narrinyeri tribe of aborigines, to whose district this part of the Murray originally belonged.

1. Lates colonorum, Gnth. Salt Water Perch.
Native name, "*Taralge.*"

This fish is found in fresh as well as brackish water, and extends as far down as the river mouth.

2. Ctenolates ambiguus, Macleay. Golden Perch.
Native name, "*Tarkee.*"

Found only in fresh water.

3. Oligorus macquariensis, Gnth. Murray Cod Perch.
Native name, "*Pondee.*"

Fresh water. Sometimes found dead, apparently killed by the salt water which collects at the bottom of Lake Alexandrina.

4. Therapon Richardsoni, Casteln. Black Bream.
Native name, "*Tcheeree.*"

Fresh water; only occasionally seen in the market. Mr. J. Douglas Ogilby unites this fish with *Therapon niger*, Cast., which, however, I consider to be distinct from the former species.

4a. Micropena.

5. CHRYSOPHRIS AUSTRALIS, Gnth. Bream.

This fish is found both in fresh, brackish, and salt water, and has a wide distribution.

6. ARRIPIS GEORGIANUS, Cuv. and Val. Tommy Rough.

Native name, "*Wankaldee.*"

A marine species, but said to occur also in the Lower Murray.

7. AGONOSTOMA DIEMENSIS, Richs. Fresh Water Mullet.

Native name, "*Conmuree.*"

This excellent food fish is very numerous in the Murray, but I do not know how far up the river it occurs. I have also seen specimens caught in the Port Adelaide River.

8. MUGIL DOBULA, Gnth. Jumping Mullet.

Native name, "*Wankaree.*"

I have seen large shoals of this fish in the Murray at Goolwa, but it is also found in the Onkaparinga, Port Adelaide River, and in many other localities on our coast.

9. SCIAENA AQUILA, Risso. Mulloway.

Native name, "*Mulloway.*"

This widely distributed marine species, which attains a large size, is sometimes found in great numbers. It enters rivers, and is sometimes found beyond the influence of the tide.

10. COPIDOGLANIS TANDANUS, Mitch. Catfish.

Native name, "*Pammoree.*"

This fresh water fish is very common in the river, as may be judged from the great number of fish occasionally seen in the market.

11. PSEUDO-APHRITES BASSII, Castl. Sanding.

Native name, "*Congaldee.*"

This fish, which attains a length of about 1 ft., is fairly common on our coast. It is abundant in the River Murray, and in the River Torrens, near Adelaide, but it is also found in many of the larger creeks. It is good eating, but its main importance is its use by the fishermen as bait for catching Mulloway. Some years ago it was known to science by only a single specimen, but has since been discovered at other localities, including the Yarra, near Melbourne, whence I have received several specimens.

12. CHATOESSUS EREBI, Rich. Bony Bream.

Native name, "*Tukkaree.*"

Although fairly common species in Lake Alexandrina, it is seldom used by white men as an article of food. But it is frequently consumed by the aborigines.

The following species also occur in the Murray, but are either too small or not numerous enough to be of any importance as an article of food:

13. ELEOTRIS MOGOURNDA, Rich. (also Rivers Onkaparinga and Torrens.
14. ELEOTRIS SP. (not identified).
15. GADOPSIS MARMORATUS, Rich. (also Rivers Onkaparinga and Torrens).
16. GOBIUS SP. (native name, "*Takarakee*").
17. GOBIUS FRENATUS, Cast. (native name, "*Tarkatukee*").
18. GALAXIAS ATTENUATUS, Jenyns. Mudfish.
    Native name, "*Pulangee.*"
19. ATHERINA SP. (native name, "*Parlee*").
20. RETROPINNA RICHARDSONI, Gill. Australian Smelt.
    Native name, "*Kantaree.*"
21. GEOTRIA CHILENSIS, Gray.
22. GEOTRIA AUSTRALIS, Gray.
23. MORDACIA MORDAX, Rich.

Notes on the Geological Features of Southern Yorke Peninsula.

By T. C. Greenway, B.Sc., and H. Tarlton Phillipps.
Communicated by Walter Howchin, F.G.S.

[Read October 21, 1902.]

Plate VII.

The late Professor Tate, in a paper read before this Society in 1889, on the Botanical Features of Southern Yorke Peninsula, gave a brief introductory sketch of the geology of the district, in which the Pleistocene deposits, Eocene limestones, and Archæan rocks were briefly described, and the recent elevation of the land, which lead to the existence of a "deserted seaway," in the Great Salt Marsh, were noted.

In 1900 Mr. Walter Howchin, F.G.S., read a paper on Evidences of Extinct Glacial Action in Southern Yorke Peninsula, in which it was shown that the glacial till beds formed the dominant geological features of the district, and occupied a stratigraphical position inferior to the Eocene limestones. The same author, a few months later, in a second paper, advanced the theory that the "salt lagoons" of the southern portions of the Peninsula (outside the area of raised beaches) were not of marine origin, but were the result of (a) the removal of the greater part of the lower Tertiary limestones by chemical solution; (b) the upper surface of the glacial clay forming a retentive floor; and (c) that the secondary deposits of travertine and saline substances were the reconstructed equivalents of the removed limestones.

It has thus been shown by the last-named author that these lagoons of the Peninsula must be divided into two classes with reference to their origin: (1) The salt lagoons produced by the removal of the Tertiary beds by solution; (2) raised beaches.

Since those belonging to class 1 occupy depressions in the surface of the glacial clay, which underlies practically the whole of the southern portion of the Peninsula, they are of considerable geological importance as indicating those districts where the glacial clay approaches the surface. Outside these areas we may, therefore, conclude that the glacial clay underlies porous beds, which do not allow the water to accumulate. The

discovery of extensive deposits of polyzoal limestone of Eocene age between Yorketown and Edithburg has shown this to be the case.

As these lagoons have been discussed in considerable detail by Mr. W. Howchin we shall confine our attention to the consideration of the second class, namely, salt marshes and raised beaches produced by a retreat of the sea consequent on a gradual elevation of the land, which has taken place in recent times. Of the latter class the great salt marsh known as Peesey Swamp, extending completely across the Peninsula from Sturt to Hardwicke Bay, forms a notable illustration.

Raised beaches occur at intervals along the coast from Point Turton at the Northern extremity of Peesey Swamp to Sturt Bay on the south. In many cases these extend a considerable distance inland, their continuity being only broken by ridges of calciferous sandstone, terminating in the headlands, some of which attain a height of 300 ft., or occasional cliffs of the same material, which in many cases must have flanked the ancient shore line.

The most extensive of these marginal raised beaches occupies the area between Point Souttar and Corney Point, extending along the coast for about fifteen miles, and in some instances stretching inland for nearly four miles. Like many of the others, this is flanked by cliffs of calciferous sandstone 60 ft. in height, which at Point Souttar rest directly on a bed of red clay 2 ft. thick, under which is 6 ft. of greenish clay lying unconformably on the highly inclined metamorphic rocks.

A raised beach was also observed overlying the Eocene about one mile west of Point Turton, and separated from it by a bed of travertine, which may represent an old land surface. Of the others the following are the principal occurrences: The Drains, Pipeclay Lagoon (Section L, Caribee), Emu Waterhole, Hilderowie Well, chain of salt lagoons lying between Marion B. and Pondalowie Bay, Stone Hut, Swivel's Hut, MacIntyre's section (Section 6, Moorowie), Tuckok Cowie.

Recent.

In an excavation in Section 42, Moorowie, a raised beach was observed, largely composed of the foraminiferal tests of *Orbitolites complanata*. Specimens of *Arca trapezia* and the pearl oyster (*Maleogrina margaretifera*) were also obtained. To-day both the pearl oyster and the *Orbitolites* are only found in warmer seas of Australia and elsewhere, and hence afford striking evidence of the climatic or other changes which have

taken place in recent times. This deposit extends for some distance through Sections 44 and 46, and evidently belongs to an older series than the raised beaches already described. In the raised beaches of Yorke Peninsula we have represented, therefore, two distinct geological horizons, corresponding exactly with the upper and lower series described by Mr. W. Howchin in connection with the raised beaches of Port Adelaide with which they may be correlated.

The height of Peesey Swamp above sea level, as shown by the aneroid, proved to be 25 ft., and the heights of all the other raised beaches being taken, it was found that they all lay between 25 ft. and 40 ft., the greater number having an elevation of about 25 ft.

Professor Tate, in the paper already referred to, suggests two possible origins of the raised beach extending across the Peninsula from Sturt Bay to Hardwicke Bay, now known as Peesey Swamp—1. A general elevation of the land. 2. The blocking up of the mouths of a shallow strait by blown sand. Now, as pointed out, there is a series of raised beaches occurring at short intervals round the southern and south-western coast of Yorke Peninsula, all having about the same elevation above sea level. This, taken in conjunction with the fact that the characteristic shells of nearly all these are the same, would seem to suggest that the whole area was simultaneously subject to a general upheaval in recent times converting all the shallow bays and straits into raised beaches and swamps, and leads to the conclusion that Peesey Swamp has probably been produced by elevation.

The chain of salt lagoons lying between Marion and Pondalowie Bays, unlike those in the neighborhood of Yorketown, is evidently of marine origin, and, like Peesey Swamp, is probably the remains of a shallow strait which stretched right across the Peninsula. The silt forming the floor of these lagoons directly overlies calciferous sandstone, which no doubt was denuded away by tidal action, which must have been at times very considerable.

Professor Tate has suggested that the beds of natural whiting which occur in this neighborhood have been produced by "the exfoliation of incoherent shell banks." That this is the case is shown by the fact that the silt also consists largely of natural whiting, which has evidently been derived from the disintegrating shell banks which form the most characteristic feature of these lagoons.

Pleistocene.

Beds of this age are widely distributed over the south-western portion of Yorke Peninsula. In general they consist mainly of calciferous sandstones, which, however, vary considerably both in texture and composition passing from a slightly calcareous sandstone to an almost pure granular limestone containing only a small percentage of silica. These first appear at Point Souttar as cliffs varying from 50 to 60 ft. in height, which continue to form the most characteristic feature of the coast as far round as Cape Spencer, where they attain a height of 300 ft. In many cases, notably at Cape Spencer, they are intercalated with lenticular beds of clay of from 1 to 2 ft. in thickness, and exhibit current bedding to a remarkable degree, which facts would seem to indicate that they were laid down in shallow water probably as an estuarine deposit.

On examination of various wells in the vicinity of Point Souttar, Corney Point, Jones' Sandhills, &c., showed these beds to overlie the glacial clay, which in its turn rests directly on the metamorphic rocks. At and in the neighborhood of Cape Spencer the glacial clay has either been completely eroded away or never existed, as the Pleistocene sands rest directly on the metamorphic rocks.

As yet there is but little direct evidence to show that these deposits are of Pleistocene age. Professor Tate has correlated them with the Pleistocene of Robe and Beachport, to which they bear a marked resemblance, both in their physical characteristics and in that, like the cliffs at Robe, they contain numerous root-like structures. Unlike the cliffs of Robe, they are apparently unfossiliferous, and contain no evidences of life, with the exception of certain foraminifera, which, however, do not definitely determine the age. At Corney Point they rest unconformably on the Eocene, whence it is evident that they are at any rate post-Eocene.

Miocene.

It has long been known that there is a deposit of Miocene age resting unconformably on the eroded surface of the Eocene, extending from a point 1¼ miles south of Edithburg to Wool Bay, a distance of about 4 miles in a straight line. Until lately no attempt had been made to determine its extent inland. Its occurrence was then noted in a well two miles to the west of Edithburg by M. H. Basedow (Trans. Roy. Soc., 1901).

We have noted further occurrences of Miocene in Lloyd's Section 263, Dalrymple, 3¼ miles north-west of Yorketown, and in a well in Cope's section (Section 47, Moorowie). Both these deposits consisted of a hard white sub-crystalline limestone, containing: *Pecten sub-bifrons*, *Pecten palmipes*, *Pecten consobrinus*, *Pecten anti-australis*, *Limatula Jeffreysiana*, *Ostrea arenicola*, *Placunanomia ione*. In the latter case the Miocene beds are 11 ft. in thickness, and rest directly on the glacial clay. Similar deposits, probably of the same age, were also observed at Kangaroo Flat, Section 35, Moorowie, and at Pink Lake, M.L., 266, Melville.

Eocene.

Rocks of this age are extensively represented between Yorketown and Salt Creek by beds of polyzoal limestone similar to those of Wool Bay both in color and texture, the upper portions being a light yellow, which changes to a dark red towards the base of the formation. This deposit was also noted in wells in the following sections:

1. Section 261s, Melville. 32 ft. to water. Polyzoal limestone.
2. Section 259, Melville.
3. Section 267, Melville. 80 ft. to water. Polyzoal limestone.
4. Boundary between Sections 267-268, Melville. 88 ft. Polyzoal limestone. 27 ft. White glacial sand to water.
5. Section 273, Melville. 36 ft. to water. Polyzoal limestone.
6. Section 80, Dalrymple. 40 ft. Polyzoal limestone. 5 ft. Conglomerate to water.

The fact that the color of the polyzoal limestone of Wool Bay and the above localities shows similar variations at various depths, the characteristic fossils of each being identical would seem to show that these are all portions of one and the same deposit. That this is the case is clearly demonstrated by numerous well sections taken at points intermediate between Yorketown and the east coast.

It will be seen from the sketch section (Plate vii.) that the Eocene beds occupy an eroded hollow in the glacial clay some 80 ft. in depth, showing that a considerable period of time must have elapsed between the laying down of the glacial clay and deposition of the Eocene limestones, especially as the land surface must have undergone depression to an extent of at least 80 ft. before this could take place.

Mr. W. Howchin, F.G.S. (Trans. Roy. Soc., June, 1900) has noted the occurence of Tertiary beds at Point Turton and Corney Point. The former first appear about half a mile east of the jetty, and extend along the coast in a westerly direction for a distance of about 2½ miles, forming an anticline rising from sea level at either end to a height of 55 ft. at the apex. The Miocene clays occupy a hollow in the eroded surface of the Eocene, which consists of polyzoal limestone, and at the western extremity of the anticline this limestone is being altered into the travertine which overlies it.

At Corney Point the outcrop of Eocene is very limited, extending along the coast for 30 ft. only, and having a thickness of 6 ft. It directly overlies the metamorphic rocks.

Glacial Clay (? Permo-Carboniferous).

There can be little doubt that the glacial clay underlies practically the whole of the southern portion of Yorke Peninsula. The principal known exposures were noted by Mr. W. Howchin (Trans. Roy. Soc., June, 1900) at—West of Troubridge Hill, Port Moorowie, Point Turton, Warooka, Yorketown, &c. In the last case the clay comprises the whole of the lake country in that neighborhood, an area of about sixty square miles. The thickness of this and the nature of the underlying formations have long been matters of speculation.

We have noted the boulder clay in the south-west portion of the Peninsula its thickness being shown by wells in the following localities, gneissic rocks in all cases underlying it:—

1. On the coast at Point Souttar, Section 133, Parawurlie. Thickness of clay, 6 ft.
2. The Leaven's section, 140E, Parawurlie. Thickness of clay, 15 ft.
3. Gaeter's Section 163, Parawurlie.
4. Hayes' Section 89, 90, Carribie. Thickness of clay, 9 ft.
5. Section 102, Carribie, five miles south of Corney Point, Thickness of clay, 12 ft. 6 in.
6. Bob's Well, Section 8, Warrenben. Thickness of clay, 16 ft.

In all the above sections Pleistocene sands or limestones overlie the glacial clay. A bore 305.5 ft. in depth, sunk about one mile east of Yorketown failed to penetrate the clay, which evidently rapidly diminishes in thickness in a westerly direction. As shown by the well sections, it will be seen that these wells lie on a line about four miles from the coast extending from Point Souttar to a point about ten miles north of Cape

Spencer. That this line approaches the present westerly limit of the glacial Till is shown by the fact that the Pleistocene sands rest directly on the metamorphic rocks at all the principal headlands on this part of the coast, the clay in all cases being absent.

Further Glacial Evidences.

In a small lagoon a quarter of a mile east of Moorowie Head Station, two large erratics of granite occur, measuring 7 ft. x 6 ft., and 3 ft. x 1 ft. respectively, exposed above the land surface. Several smaller erratics (one of which a microscopical section has shown to be diabase) were seen in the adjoining fields.

On the western shore of Davey's Lake, Section 478, Melville. due south of Pink Lake, over 100 erratics were counted, many of them being of considerable size. The two largest consisted of quartzite and granite respectively, and measured 3 ft. x 2 ft. 6 in. and 2 ft. x 18 in. exposed above the surface ground, the granite being chiefly characterised by large crystals of orthoclase. The smaller stones consisted mainly of quartzite and granite. A small erratic also occurs beside the main road to Corney Point at the junction of Sections 158 and 159, Carribie. In all cases the different rocks of which the erratics are composed may be seen *in situ* in various localities along the south and west coasts.

Archean.

Rocks of this age are very widely distributed over southern Yorke Peninsula, underlying the glacial clay, and forming the basal portion of nearly all the headlands on the west and south-west. In general they are gneissic in character, and show no traces of a sedimentary origin, unless it be in some very obscure (?) bedding in some of the rocks at Point Souttar. In nearly all cases they are highly contorted, and show large developments of biotite along the lines of foliation, indicating a very advanced state of metamorphism, which, as a rule, becomes more pronounced as the southern portions of the Peninsula are approached.

Metamorphic rocks first appear at Brutus Castle, on the north-west coast, as low reefs of aplite and fine-grained hornblendic gneiss, the latter passing into hornblendic schist where the crushing has been extreme. In this outcrop, which extends along the coast towards Corney Point for about four miles, a very remarkable rock occurs, consisting of a granulitic base of quartz and pink felspar with ragged sections of a very strongly pleochroic amphibole, the predominant color of which

is a dark blue. This is in all probability Riebeckite, which has only lately been found in the granites of Socotra and some of the British eurites. A notable point in conection with this outcrop is the absence of dykes, which form such a characteristic feature in all the others.

At Corney Point the rocks consist of gneiss and hornblendic schist, intersected in all directions by dykes of pegmatite characterised by large masses of microcline and oligoclase felspars and segregations of quartz. That these are dykes and not segregation veins is shown by the following facts:—

1. That in some cases we find fragments of gneiss entangled in the intrusive masses.

2. That the dykes strike across the folia of the gneiss, which in some cases have been drawn round from their original positions into a direction more or less parallel to the line of flow of the intrusive mass in a manner suggestive of a semi-viscous mass forcing its way through a fissure in a rock reduced to a quasi-plastic condition by heat and pressure.

3. Contact metamorphism is strongly evidenced in the neighborhood of many of the dykes by the development of large masses of biotite at the line of contact, and sometimes by an alteration of the adjacent rock.

In all other cases the metamorphic rocks are similar to those of Corney Point, containing segregations more or less acid in character, and sometimes crystals of wolfram, amphibole, &c. On the south side of Daly Head, which, like most of the others, is composed of Pleistocene sands resting on metamorphic rocks, they occur in the form of low reefs running out into the sea, separated by short stretches of sand. As far as can be seen, these reefs are identical in composition. A curious point is that two adjacent reefs, like the pebbles of MacDonnell Bay, are completely coated with silica, while in the others this phenomenon is absent. Why these and not the other reefs should be so affected it is difficult to see, as they all strike in the same direction and occupy similar positions relatively to the sea.

In the gneiss at the base of Cape Spencer a large dyke of dolorite occurs, resembling a huge dumbbell in shape about 100 ft. long by 50 ft. in width at the broadest part. This is intersected along its major axis by a dyke of gneissic aplite which meets a narrow dyke of gneissic biotite granite running through the dolorite at right angles to the former. The granite and aplite dykes, however, do not cut one another.

An outcrop of metamorphic rocks extends along the coast

between Hillock Point and Point Yorke for about five miles. These mainly consist of gneiss, more or less granitoid, characterised by numerous veins of quartz and felspar. The gneiss is usually coarsely crystalline, the folia being very clearly defined, while the granite is mainly reddish in color, and contains numerous acid segregations.

The principal feature of this locality is a large dyke of diorite. In the neighborhood of this the gneiss is contorted to a remarkable degree, masses of biotite, exceeding 2 ft. in thickness, being developed in the vicinity of some of the dykes as a result of contact metamorphism, the biotite in many cases passing first into an augen gneiss, and then into a true granite or gneiss at a short distance from the dyke. These dykes of dolorite and diorite respectively are of special interest as being the only known occurrences of unaltered basic eruptive rocks in southern Yorke Peninsula.

Conclusion.

Additional evidence in favor of Mr. W. Howchin's theory as to the origin of the salt lagoons in the neighborhood of Yorketown is furnished by the fact that these seem to be confined entirely to the district where the glacial clay outcrops, and since we find beds of Tertiary limestone on either side of this district, we may, therefore, infer that the intermediate deposits have been removed by solution as he suggests. Furthermore, at Point Turton, where the polyzoal limestone is exposed in the cliff face, we have unmistakable evidence of its replacement by travertine, which attains a thickness of from 15 to 16 ft., and in some cases penetrates nearly to the base of the formation. Outside this lake area we find numerous salt lagoons and marshes, which, however, not only differ in a very marked manner from the former in their physical characteristics, but also present unmistakable evidence of their marine origin in numerous exfoliating shell banks.

A glance at the sketch section from Corney Point to Edithburg will show that the glacial till was laid down in an eroded hollow in the Archæan rocks, which increases in depth towards the east, the principal Eocene deposits occupying an analogous position with regard to the glacial clay, while the Miocene beds were likewise deposited in a hollow on the east side of the Eocene. The striking similarity existing between these three cases is suggestive of a common agent of erosion. though possibly the erosion of the Archæan rocks may have been brought about by a glacier flowing along a depression bounded

on the east by the hills at Hallet's Cove and on the west by a ridge of metamorphic rocks, the remains of which appear at the present day at the base of the more recent formations along the south-west coastline of southern Yorke Peninsula.

Our acknowledgments are due to Messrs. E. H. Matthews and J. Mitchell, of Yorketown, and Mr. Barclay, of Corney Point, and to others who by their kindness rendered possible what otherwise would have been a task of no little difficulty.

List of the Described Genera and Species of the Australian and Polynesian Phasmidæ (Spectre-Insects).

By J. G. O. Tepper, F.L.S., F.S.Sc., &c.

[Read October 21, 1902.]

1. MYRONIDES, Stål, Rev. Orth., III., p. 8, 1875.

(Type—*Lonchodes Pfeifferæ*, Westw., Cat. Orth., p. 44, pl. 5, f. 6.)

M. FILUM, Sharp, Willey's Zool. Results, 1897, p. 81, pl. 7, f. 1.
M. BINODES, Sharp, *l.c.*, f. 2.
M. BITUBER, Sharp, *l.c.*, p. 82.
M. SIMPLEX, Sharp, *l.c.*, p. 83, f. 3.
M. SORDIDUS, Sharp, *l.c.*, p. 83.
M. RAMULUS, Sharp, *l.c.*, p. 83.
Hab.—New Britain.

2. LONCHODES, Gray, Syn. Phas.; Westwood, *l.c.*, p. 36; Stål, *l.c.*, p. 8, 66.

(Type—*L. geniculatus*, Westwood.)

L. NIGROPUNCTATUS, Kirby, Trans. Linn. Soc., Lond., VI., p. 453.
Hab.—Lizard Island (Queensland).

3. DIXIPPUS, Stål, *l.c.*, p. 9, 66 (1875).

(Types—*Lonchodes nematodes*, Westw. (female), Cat. Phas., p. 421; and *Phasma* (*Bacteria*) *nodosum*, DeHaan (male), Orth., p. 133.)

D. (?) INSULARIS, Kirby, *l.c.*, p. 460.
Hab.—Thursday Island (New Guiuea).

4. HYRTACUS, Stål, Rev. Orth, p. 10.

(Type—*Bacteria eutrachelia*, Westw., *l.c.*, p, 32, pl. 34, f. 11).

H. TUBERCULATUS, Stål, *l.c.* (*B. eutrachelia*, Westw.), p. 67.
Hab.—Western Australia.

5. BRACHYRTACUS, Sharp, Willey's Zool. Results, 1898.

B. CELATUS, Sharp, *l.c.*, p. 84, pl. 7, f. 4.
Hab.—New Britain.

6. PACHYMORPHA, Gray, Syn. Phas.; Stål, *l.c.*, p. 9 (*Phasma, Bacillus* &c., auct.).

P. SQUALIDA (Hope), Gray, *l.c.*; Westwood, Cat. Orth., p. 15, pl. 22, f. 4 (fem.).

Hab.—Australia.

P. (?) SIMPLICIPES, Serv.; Westwood, *l.c.*, p. 15.
Hab.—Australia.

P. HISTRICULEA, Westwood, *l.c.*, p. 16, pl. 1, f. 4 (fem.); Hutton, Trans. N.Z. Inst., XXXI., p. 52.
Hab.—New Zealand.

P. NOVÆGUINEÆ, Kaup, Berl. Ent. Zeitschr., XI., p. 26 (1871).
Hab.—New Guinea.

P. ANNULATA, Hutton, Trans. N.Z. Inst, XXX., 1897, p. 162.
Hab.—New Zealand.

P. SALEBROSA, Hutton, *l.c.*, XXXI., p. 52.
Hab.—New Zealand.

P. ACORNUTA, Hutton, *l.c.*, p. 53.

7. CANDOVIA, Stål, *l.c.*, pp. 12, 70.

(Type—*Bacteria coenosa*, Gray (Hope MS.)).

C. COENOSA, Gray; Westwood, *l.c.*, p. 33, 71 (*B. tenuis*, Hope, male; *B. coenosa*, female, *B. fragilis*, larva, Hope).
Hab.—North Australia.

8. PROMACHUS, Stål, Rev. Orth., p. 17.

P. SORDIDUS, Kirby, Trans. Linn. Soc. Lond., VI., p. 463, pl. 40, f. 4.
Hab.—Thursday Island (N. Guinea).

9. PHIBALOSOMA, G. R. Gray, Syn. Phas.; Stål, *l.c.*, p. 28.

(*Cladoxerus*, Gray, male; *Cladomorphus*, Gray, female; *Xylodus*, Sauss., female).
The genus extends to India and South America.

P. CAPRELLA, Westwood, Cat. Phas., p. 76, pl. 21, f. 3 (male).
Hab.—Australia.

P. DAVIDIS, LeGuill.; Westw., *l.c.*, p. 77.
Hab.—Solomon Islands.

P. BRITANNIÆ, Wood-Mason, Journ. Asiat. Soc. Bengal, XLVI., p. 75, 351. *P. feejeeanus*, Westw.).
Hab.—New Britain.

P. APOLLONIUS, Westwood, *l.c.*, p. 181, pl. 40, f. 4 (female).
Hab.—Fiji Islands.

10. BACTERIA, Latr.; Stål, *l.c.*, p. 29.

Most of the species of this genus have been distributed among other genera by Stål.

B. FRENCHI, Wood-Mason, Ann. Mag. Nat. History, Fourth Series, vol. XX., 1878, p. 78.
Hab ?—

11. BACTRIDIUM, Saussure, Mel. Orth., I., 1868-71, p. 125; Stal, *l.c.*, p. 30.

B. COULONIANUM, Sauss., *l.c.*, p. 126, pl. 2, f. 8.
Hab.—? Australia (? Chili).

12. CLITARCHUS, Stål, Rev. Orth., III., p. 34, 82.

(*Bacteria, Bacillus, Acanthoderus*, &c., auct., pars.)

C. HOOKERI, White, Zool. "Ereb. and Terr.," p. 24, pl. 6, f. 6; Westwood, Cat. Phas., p. 14; Hutton, Tr. N.Z. Inst., 1898, p. 54.
Hab.—New Zealand.

C. COLOREUS, Colenso, Trans. N.Z. Inst., XVIII., p. 151; Hutton, *l.c.*, 54.
Hab.—New Zealand.

C. LAEVIUSCULUS, Stål., *l.c.*, p. 82; Hutton, *l.c.*, p. 56.
Hab.—New Zealand.

C. REDUCTUS, Hutton, Trans. N.Z. Inst., XXXI. (1898), p. 55.

13. ARGOSARCHUS, Hutton (*Clitarchus*), Trans. N.Z. Inst., XXX., 1897, p. 165; XXXI., 1898, p. 58.

A. HORRIDUS, White, *l.c.*, p. 24, pl. 5, f. 4; Westwood, *l.c.*, p. 49; Hutton, *l.c.*, 58.
Hab.—New Zealand.

A. GERHARDII, Kaup., Proc. Zool. Soc. Lond., 1866, p. 577.
Hab.—Southern Island, New Zealand.

A. SYLVATICUS, Colenso, Trans. N.Z. Inst., XIV., 1882, p. 278.
Hab.—Hawke Bay, N.Z.

14. ACROPHYLLA, Gray, Ent. Austr.; Westwood, *l.c.*, p. 113; Stål., *l.c.*, p. 34.

(*Phasma, Diura, Cyphocrania, Ctenomorpha, Dairus, Lopaphus*, auct.)

A. TITAN, Macleay, in King's Surv. Austr., II., 454; Westwood, *l c*, 114.
Hab.—Australia.

A. BRIAREUS, Gray, Trans. Ent. Soc., I., p. 45; Westw., *l.c.*, 114.

A. CHRONUS, Gray, Syn. Phas., p. 39; Ent. Austr., I., pl. 50, f. 2.; Westw., *l.c.*
Hab.—Australia.

A. JAPETUS, Gray, Syn. Phas., p. 41; Ent. Austr., I., pl. 50, f. 1; Westwood, Cat. Phas., p. 114.
Hab.—Melville Island (N. Australia).

A. OSIRIS, Gray, Trans. Ent. Soc., I., p. 46, Syn. Phas., p. 40 (= *spinicollis*, Gray); Westwood, *l.c.*, p. 115.
Hab.—North Australia.

A. ACHERON, Gray, *l.c.*, p. 46, 40; Westwood, *l.c.*, 115.
Hab.—N. Australia.

A. MACLEAYI, Gray, Syn. Phas., p. 41; Westwood, *l.c.*, 115.
Hab.—Australia.

A. TESSELATA, Gray, *l.c.*, p. 44; Westwood, *l.c.*, 115.
Hab.—Queensland.

A. SALMACIS, Westwood, *l.c.*, p. 116, pl. 37, f. 2.
Hab.—Northern Australia.

A. VIOLASCENS, Leach, Zool. Mix., I., p. 9; Gray, Syn. Phas., p. 40; Ent. Austr., pl. 6., f. 1; pl. 7, f. 1 (*roseipennis*); Westwood, *l.c.*
Hab.—Queensland (Australia).

A. MACROTEGMA, Tepper (*Lopaphus macrotegmus*, Tepper), Trans. Roy. S.A., IX., 1886, p. 112, pl. vi.
Hab.—South Australia.

A. TASMANIENSIS, Lea, separate print, 1902.
Hab.—Tasmania.

15. ACANTHODYTA, Sharp, Willey's Zool. Results, 1898.

A. SPINIVENTRIS, Sharp, *l.c.*, p. 85.
Hab.—Lifu, Fiji Islands.

16. CTENOMORPHA (G. R. Gray), Stål., Rev. Orth., p. 35.

Ct. NIGROVARIA, Stål, *l.c.*, III., p. 83.
Hab.—Cape York, Queensland.

Ct. ALBOPUNCTATUM, Kirby, Trans. Linn. Soc. Lond., VI., p. 472, pl. 39.
Hab.—Queensland.

17. CYPHOCRANIA, Serville, Enc. M. X., p. 445. Stål, *l.c.*, p. 35; Westwood, Cat. Orth., p. 106 (*Eurycnema*).

C. REINWARDTII, DeHaan, Orient. Orth., p. 130, pl. 10, f. 1 (male); Westwood, *l.c.*, p. 107.
Hab.—New Guinea.

C. GOLIATH, Gray, Trans. Ent. Soc., I., p. 45; Syn. Phas., p. 39; *C. versirubra*, Serv., Orth., p. 235; Westw., *l.c.*, 107.
Hab.—Java; Timor; N. Guinea; N. Australia; Queensland.

C. PASIMACHUS, Westwood, *l.c.*, p. 109, pl. 9, f. 5 (female).
Hab.—Australia.

C. HERCULANEA, Charpentier, Orth. pl. i. (1841), female; *C. versifasciata*, Serv., male (?), H. N. Orth., p. 235; *Eur. aestuans*, Karsch., Ent. Nachr., XXIV., p. 365; *C. Hanitschi*, Sharp, Willey's Zool. Res., p. 89 (1898); Brunn., Mitth. Mus. Hamb., XV., p. 4.
Hab.—Java; North Australia.

18. OPHICRANIA, Kaup, Berl. Ent. Zeitschrift, 1871.

O. STRIATICOLLIS, Kaup, *l.c.*, p. 38.
Hab.—Australia.

19. ANCHIALE, Sharp, Willey's Zool. Res., 1898.

(*Cyphocrania maculata*, auct., pars.)

A. CONFUSA, Sharp., *l.c.*, p. 80; Westwood, Cat. Orth., p. 111 (nov. nom. pro *C. maculata*, West., pars.).
Hab.—Amboyna; Sandwich Islands.

A. STOLLII, Sharp, *l.c.*, p. 89 (*C. maculata*, auct. p.).
Hab.—Lifu, Fiji Islands.

20.—CLEMACANTHA, Rainbow, Rec. Austr. Mus., III., 1897.

C. REGALE, Rainbow, *l.c.*, p. 34, pl. 9 (possibly referable to *Cyphocrania herculanea*, Sharp).
Hab.—New South Wales; Queensland.

21. VETILIA, Stål, Rev. Orth., III. (*Cyphocrania*, p.); Stål., *l.c.*, p. 36; Westwood, *l.c.*

V. ENCELADUS, Westwood, *l.c.*, p. 108, pl. 39, f. 1, 2; Stål, *l.c.*, p. 84.
Hab.—Australia.

22. DIURA, Gray, *l.c.*; Stål, *l.c.*, p. 37.

D. VIRGINEA, Stål, *l.c.*, p. 84 (male). Near *D. violascens*.
Hab.—Cape York, Queensland (N. Australia).

23. TROPIDODERUS, Gray, Syn. Phas., p. 31; Westwood, *l.c.*, p. 165; Stål, p. 38.

(*Diura, Triyonoderus.*)

T. CHILDRENI, Gray (female), *T. typhœus*, Gray (male), Ent. Austr., I., p. 26, pl. 3, f. 1; pl. 6, f. 2; Syn. Phas., pp. 31, 40; Westwood, *l.c.*, p. 165.
Hab.—N.E. Australia.

T. IODOMUS, McCoy, Prod. Zool. Vict., pl. 69, 70, f. 2, 3.
Hab.—Victoria.

T. RHODOMUS, McCoy, *l.c.*, fig. 1.
Hab.—South Australia; Victoria.

T. DECIPIENS, Rainbow, Rec. Austr. Mus., III.
Hab.—New South Wales.

24. LYSICLES, Stål, Compt. Rend. Belg., XX., 1876.

L. HIPPOLYTUS, Stål, *l.c.*, Esp. nouv. Phas., p. 65.
Hab.—Queensland.

25. PODACANTHUS, Gray, Ent. Austr.; Syn. Phasm.; Westwood, *l.c.*, 116; Stål, *l.c.*, p. 38.

P. TYPHON, Gray, *l.c.*, p. 32, pl. 2, f. 1; *P. unicolor*, Charp., Orth., pl. 56; Westwood, *l.c.*, p. 117.
Hab.—New South Wales; Australia.

P. VIRIDIROSEUS (Curt., M.S.), Gray, *l.c.*, p. 43; Westwood, *l.c*, 117.
Hab.—Queensland; S. Australia.

P. WILKINSONI, Macleay, Proc. Linn. Soc. N.S.W., VI., pp. 536, 1882.
Hab.—New South Wales.

26. VASILISSA, Kirby, Trans. Linn. Soc. Lond., VI., p.

V. WALKERI, Kirby, *l.c.*, p. 489.

27. GIGANTOPHASMA, Sharp, Willey's Zool. Res., 1898.

G. BICOLOR, Sharp, *l.c.*, p. 87, pl. 7, f. 6.
Hab.– Lifu, Fiji Islands.
G. PALLIPES, Sharp, *l.c.*, p. 88, pl. 7, f. 5.
Hab.—Lifu, Fiji Islands.

28. EXTATOSOMA, Gray, Syn. Phas.; Ent. Austr.; Westwood, Cat. Orth., p. 170; Stål, Rev. Orth. III., p. 38.

E. TIARATUM, Macleay, King's Surv. Austr. App. II., p. 455, pl. B, f. 3, 4; Gray, *l.c.*, p. 29; I., pl. 8, f. 1, 2; Westwood, *l.c.*, p. 170.
Hab.—N.S. Wales (Australia); New Guinea; Tasmania.
E. BUFONIUM, Westwood, Thes. ent. Oxon., 1874, p. 174, pl. 32, f. 2.
Hab.—Australia.

29. GRÆFFEA, Brunn.; Stål, *l.c.*, p. 40 (*Lopaphus*, pars.; *Anophelepis*, pars.)

G. COCCOPHAGA (Gray), Westwood, *l.c.*, p. 99; *A. fulvescens*, Sauss., Mel. Orth. II., p. 117, pl. 2, f. 3, 4, 1869.
Hab.—Navigator Islands; Tonga; Fiji.
G. LIFUENSIS, Sharp, Willey's Zool. Res., 1898, p. 86, pl. 7, f. 21.
Hab.—Lifu, Fiji Islands.

30. NECROSCIA, Serville, H.N., Orth., p. 250; Westwood, *l.c.*, p. 128; *l.c.*, p. 41.

N. ARUANA, Westw., *l.c.*, p. 134, pl. 39, f. 4.
Hab.—Aru Islands (N. Guinea).
N. CARTERUS, Westw., *l.c.*, p. 138, pl. 15, f. 5.
Hab.—Australia.
N. SARPEDON, Westw., *l.c.*, p. 138, pl. 32, f. 5; pl. 16, f 1.
Hab.—Northern Australia.
N. CURTIPES, Westwood, Cat. Orth., p. 143.
Hab.—Prince of Wales Island (N. Guinea).
N. ANNULIPES (Curt. MS.), Gray, Syn. Phas., p. 37 (*Platycrania*); Westw., *l.c.*, p. 150.
Hab.—India, &c.; Australia.
N. PAPUANA, Branscik, Jahrb. nat. wiss. Ver., Trencs., XXXI., pl. 2, fig. 9.
Hab.—New Guinea.
N. DISTINCTA, Branscik, *l.c.*
Hab.—New Guinea.

31. MEGACRANIA, Kaup, Berl. Ent. Zeitschr., XI.
(*Platycrania*, Westw.).
M. PHELAUS, Westw., Cat. Orth., p. 113, pl. 27, f. 5.
New genus for this species as a type.
Hab.—Fiji Islands.

32. LOPAPHUS, Westwood, *l.c.*, p. 99.
Orxines, Stål, Rev. Orth. III.. p. 43.
L. GORGUS, Westwood, *l.c.*, p. 102, pl. 11, f. 4.
Hab.—New South Wales.

33. ANOPHELEPIS, Westwood, *l.c.*, p. 68.
Græffea (Brunn.), Stål. (pars.), p. 40, 84.
A. TELEPHORUS, Westw., *l.c.*, p. 69, pl. 8, f. 3, 7.
Hab.—Western Australia.
A. PERIPHANES, Westw., *l.c.*, p. 100, pl. 8, f. 2.
Hab.—Australia.
A. RHIPHEUS, Westw., *l.c.*, p. 100, pl. 8, f. 10.
Hab.—Western Australia.

34. CHONDROSTETHUS, Kirby, Trans. Linn. Soc. Lond., VI., p. 472 (for *Thrasyllus*, Stål, Orth. Ins. Phil., p. 41).
CH. WOODFORDI, Kirby, *l.c.*, p. 455. pl. 39, f. 1, 2.
Hab.—Solomon Islands.

35. HERMARCHUS, Stål, Rev. Orth. III., p. 45, 89.
(*Phibalosoma*, Westw., *l.c.*, pars.)
H. PYTHONIUS, Westwood, *l.c.*, p. 73, pl. 35, f. 3; pl. 12, f. 1.
Hab.—Fiji Islands.

36. ASPRENAS, Stål, *l.c.*, p. 45.
A. FEMORATUS, Stål., *l.c.*, p. 89.
Hab.—New Caledonia.

37. NEANTHES, Stål, *l.c.*, p. 45.
N. BRUNNERI, Stål, *l.c.*, p. 90.
Hab.—New Caledonia.
NOTE.—This genus and species is stated by Brunner (Rev. Syst. Orth., 1893, p. 83) to represent the female of the preceding.

38. KARABIDION, Montrouzier (*Eurycantha*, p.), Ann. Sc. Lyon, ser. 2, VII., p. 81; Stål, *l.c.*, p. 46, 90.
K. AUSTRALIS, Mont., *l.c.*, p. 86; Westw., *l.c.*, p. 65, pl. 1, f. 1, 2.
Hab.—Lord Howe's Island.

39. EURYCANTHA, Boisd., Voy. Astrolabe, Zool. Ent.; Westwood Cat. Orth., p. 62; Stål, Rev. Orth., III., p. 46.
E. HORRIDA, Boisd., *l.c.*, p. 647, pl. 10, f. 2; Westw., *l.c.*, p. 63.
Hab.—Dorei, N. Britain; Woodlark Is. (N. Guinea).

E. TYRRHAEUS, Westw., *l.c.*, p. 64, pl. 2, f. 1.
Hab.—New Hebrides; Loyalty Islands.
E. MICRANTHA, Montr., Ann. Sc. Lyon, ser. 2, VII., p. 85; Westw., *l.c.*, p. 64.
Hab.—Woodlark Island (N. Guinea).
E. SCORPIONIDES, Monr., *l.c.*, suppl., p. 85; Westw., *l.c.*, p. 64.
Hab.—Woodlark Island.
E. ROSENBERGI, Kaup, Berl. Ent. Zeitschr., XI., p. 34 (1871).
Hab.—New Guinea.
E. ECHINATA, Lucas, Bull. Soc. Ent. France, VIII., p. 163 (1878).
Hab.—New Guinea.

40. CANACHUS, Stål, *l.c.*, p. 47.

C. CROCODILUS, Stål, *l.c*, p. 90.
Hab.—New Caledonia.
C. SALAMANDRA, Stål, *l.c.*, p. 91.
Hab.—New Caledonia.

41. DIMORPHODES, Westwood, *l.c.*, p. 80.

D. PROSTASIS, Westw., *l c.*, p. 81, pl. 34, f. 4, 5.
Hab.—Aru Islands (New Guinea).

42. HETEROPTERYX, Gray, Syn. Phas.; Westw., Cat. Orth., p. 81; Stål, Rev. Orth., III., p. 48.

H. AUSTRALIS, Kirby, Trans. Linn. Soc. Lond., VI., p. 472.
Hab.—Australia.

43. ACANTHODERUS, G.R. Gray, Syn. Phas.; Westwood, Cat. Orth., p. 48; Stål, Rev. Orth., III., p. 49.

(*Phasma*, *Bacteria*, *Raphiderus*, *Clitarchus*, *Sect. B.*, Hutton).
A. SPINOSUS, Gray, *l.c.*, p. 14; Westw., *l.c.*, p. 48.
Hab.—Western Australia.
A. SPINIGER, White, Voy. "Er. and Terr.," p. 24; Westw., *l.c.*, p. 48; Hutton, Trans. N.Z. Inst., XXX, 1897, p 164.
Hab.—New Zealand (North Island?).
A. OCCIPITALIS, Kaup, Berl. Ent. Zeitschr., XI., 1871, p. 31.
Hab.—Celebes, New Guinea.
A. ATRO-ARTICULATUS, Colenso, Trans. N.Z. Inst., XVII., p. 154; Hutton, *ibid*, XXX, p. 164.
Hab.—New Zealand.
A. PRASINUS, Westw., *l.c.*, p. 49, pl. 3, f. 2; Hutton, *l.c.*, p. 164.
Hab.—New Zealand (North and South Island).
A. FILIFORMIS, Colenso, *l.c.*, p 153; Hutton, *l.c.*, p. 164.
Hab.—New Zealand (Hawke Bay).
A GEISOVII, Kaup, Proc. Zool. Soc. Lond., 1866, p. 578; Hutton, *l c.*, p. 165.
Hab.—New Zealand (Great Barrier Is., Canterbury).

A. SUTERI, Hutton, *l c.*, XXXI, p. 56 (1898).
Hab.—New Zealand (Wanganui, N. Island).
A. FASCIATUS, Hutton, *l.c*, p. 58.
Hab.—Great Barrier Is., N. Zealand.

44. PYLÆMENES, Stål., Rev. Orth., III., p. 51.

(*Acanthoderus*, West., pars.)
P. CORONATUS, DeHaan, Orth. Orient., p. 134, pl. 14, f. 4, 5; Westwood, Cat. Orth., p. 51; Stål., *l.c*, p. 93.
Hab.—Amboyna, Ceram, Australia.

45. METRIOTES, Westwood, *l.c.*, p. 158; Stål, *l.c.*, p. 60.

(*Platycrania*, Gray, pars.)
M. AGATHOCLES, Stål, *l.c.*, p. 100.
Hab.—(?) Australia.

46. PRISOPUS, Stål, *l.c.*, p. 60.

(*Xeroderus*, Gray; Westwood, *l.c.*, 102)
P. KIRBYI, Gray, Syn. Phas., p. 32; Westw., *l.c*, pl. 31, f. 6, 7.
Hab.—Australia.

47. LEOSTHENES, Stål, *l.c.*, p. 60.

L. AQUATILIS, Stål, *l.c*, p. 102.
Hab.—New Caledonia.

48. BACILLUS, Latreille; Westw., *l.c.*, p. 3; Stål, *l.c.*, 61.

B. BEECHEYI, Gray, Syn. Phas., p. 21; Burmeister, Handb, II., p. 562; Westwood, *l.c*, p. 12.
Hab.—Sandwich Islands (Hawaii).
B. BRUNNEUS, *l.c.*; Ent. Austr., pl. 7, f. 3.
Hab.—Western Australia.
B. AUSTRALIS, Charp., Orth. descr., p. 57; Westw., *l c.*, p 12.
Hab.—Australia
B. DOLOMEDES, Westw., Cat. Orth. Ins., p. 13, pl. 5, f. 4.
Hab.—Australia.
B. PERISTHENES, Westw., *l.c.*, p. 13, pl. 7, f. 1; pl. 8, f. 2.
Hab.—Australia.
B. PERIDROMES, Westw, *l.c.*, p. 13, pl. 8, f. 2*b*, 2*c*.
Hab.—Australia.
B. MINIMUS, Colenso, Trans. N.Z. Institute, XVII., p. 185.
Hab.—(?) New Zealand.

49. CACOMORPHA, Sharp, Willey's Zool. Res., 1898.

C. ABERRANS, Sharp, *l c.*, p. 91, pl. 8, f. 12.
Hab.—Lifu, Fiji Islands.

50. PHYLLIUM, Illiger, &c ; Westwood, *l.c.*, p. 171; Stål, *l.c.*, p. 104.

(*Gryllus*, *Mantis*, *Phasma*, *Pterepus*.)

PH. SICCIFOLIUM, Linn., &c., Cuvier, Reg. An, pl. 79; Westwood, *l c.*, p. 172.

Hab.—India, Java, Timor, N. Guinea.

PH. GERYON, Gray, in Zoologist, 1843, I., 118; DeHaan, Orth. Orient., pl. 15, f. 7.

Hab.—Philippine Is.; (?) New Caledonia (Mus. Adel.).

51. CHITONISCUS, Stål, *l.c.*, p. 62.

(*Phyllium*, Westw., p)

CH LOBIVENTRIS, Blanch., in d'Urville, Zool. Voy. Pole Sud, IV., p. 359, pl. 50, f. 9; Westw., *l c*, p. 174, pl. 39, f. 5.

Hab.—Levuka, Ovalau, Fiji Islands.

CH FEEJEEANUS, Sharp, Willey's Zool. Results, 1898, p. 87, pl 8, f. 14.

Hab.—Fiji Islands.

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FURTHER NOTES ON AUSTRALIAN COLEOPTERA, WITH DESCRIPTIONS OF NEW GENERA AND SPECIES.

By the Rev. T. BLACKBURN, B.A.

[Read October 21, 1902.]

XXXI.

STAPHYLINIDÆ.

LEUCOCRASPEDUM.

L. lugens, Blackb. In describing this species (supra, p. 18) I accidentally omitted to state that I met with it in N.S. Wales, on the Blue Mountains. Mr. Lea reports it from Tasmania.

SILPHIDÆ.

CLAMBUS.

C. Simsoni, sp. nov. Brevis; sat latus; nitidus; setis brevibus subtilibus aureis sparsius vestitus; antice lævis sed elytris pone medium sat fortiter minus crebre punctulatis; supra rufo-brunneus, elytris versus margines infuscatis; subtus, capite prothorace et coxis posticis testaceis; antennis palpis pedibusque testaceis; antennarum articulis 2° quam 3^{ti} fere duplo longiori, 3° 4° que sat elongatis inter se sat æqualibus, 5°—7° brevibus, 7° quam 6us sat latiori, 8° magno vix transverso quam præcedentes 3 conjuncti vix breviori, 9° quam 8us vix breviori subangustiori; elytrorum stria subsuturali nulla. Long., $\frac{1}{2}$ l.

Smaller than the European *C. armadillo*, DeG., and less narrowed behind, the colour very different, and the puncturation of the hinder part of the elytra very evidently stronger. This genus has not hitherto been recorded as Australian.

Tasmania; sent to me by Mr. A. Simson.

C. Tasmani, sp. nov. Minus brevis, postice angustatus; nitidus; setis elongatis fulvis sparsim vestitus; vix manifeste punctulatus; rufo-brunneus, elytrorum disco infuscato; pedibus testaceis; elytrorum stria subsuturali postice sat profunda. Long., $\frac{7}{10}$ l.

I am not able to examine the antennæ of this species, of which I have only a single specimen. It is however very distinct from all the other Australasian *Clambi* known to me by the very long and very sparse fine setæ of its upper surface. In build it resembles *C. armadillo*, but it is a trifle larger and especially broader.

The puncturation of its upper surface is scarcely traceable, though under a microscope each seta is seen to spring from a small puncture.

Tasmania.

C. tierensis, sp. nov. Minus brevis, postice angustatus; nitidus; supra lævis; niger, antennis (clava infuscata excepta) palpis pedibusque testaceo-brunneis, marginibus lateralibus anguste rufescentibus; antennarum articulis 2° quam 3us haud multo longiori, 4° 5° que inter se sat æqualibus quam 3us manifeste brevioribus, 6° brevi, 7° sat majori transverso, 8° quam 7us multo majori (quam præcedentes 2 conjuncti vix longiori) sat fortiter transverso, 9° subquadrato quam 8us vix breviori manifeste angustiori. Long., $\frac{7}{10}$ l.

Easily distinguished from the preceding two species by its dark colour, non-punctulate upper surface, and absence of pubescence.

Tasmania (The Tier, also sent by Mr. A. Simson).

PHALACRIDÆ.

LITOCRUS.

L. plagiatus, sp. nov. Ovalis; nitidus; supra niger, capite antice pronoti marginibus et in elytris macula magna communi rufis; subtus cum antennis palpis pedibusque testaceo-brunneis; antennarum articulis 3° quam 4us dimidio longiori, 4° longiori quam latiori, 5° 4° æquali, 6° 7° que inter se æqualibus quam 5us sat brevioribus, 8° 7° paullo longiori haud transverso, 9° quam 8us multo majori leviter transverso, 10° quam 9us breviori fortiter transverso, 11° quam 9us sat longiori; capite pronotoque subtilissime confertim punctulato, hoc latera versus puncturis paullo majoribus nonnullis impresso; pronoto fortiter transverso, stria laterali pone marginem anticum intus curva et marginem anticum oblique attingenti; elytris seriatim (pro genere *Litocro* sat fortiter) punctulatis, puncturis antice obsoletis, interstitiis crebrius subtilissime (sed plane perspicue) punctulatis, alternis sparsim seriatim puncturis majoribus (his puncturis serierum æqualibus sed inter se multo magis distantibus) impressis; tarsis posticis sat robustis, articulo basali quam 2us circiter duplo longiori. Long., $1\frac{1}{2}$ l.; lat., $\frac{9}{10}$ l.

This species I confused with *L. maculatus*, Blackb., when I described that species, from which it differs in size (being constantly larger), in the very evidently larger eighth joint and club of its antennæ, and in the shape of the common red spot on its elytra (the front margin of which is triangularly concave, while in *maculatus* it is triangularly convex). A specimen from Sydney

does not seem to differ except in the larger size of the red blotch on the elytra, which however does not differ in shape. A specimen from Tamworth (N.S.W.) is quite like the Victorian example. The lateral marginal stria of the pronotum turns obliquely inward and forward at a short distance behind the front of the segment and runs across to the front margin, so as to cut off the front corner of the segment by a fine line. Colour being disregarded this species resembles *L. major*, Blackb., but differs *inter alia* by its feebler puncturation which on the elytra is obsolete on the front three-quarters of their length.

Victoria and N.S. Wales.

L. lautus, sp. nov. Ovalis; nitidus; supra piceus vel rufo-piceus, capite antice prothoracis marginibus elytrorum macula communi magna et elytrorum apicibus (late) rufis vel testaceo-brunneis; subtus cum antennis palpis pedibusque testaceo-brunneis; cetera fere ut præcedentis (*L. plagiati*) sed ex puncturis elytrorum interstitiorum minoribus quam *L. plagiati* multo minus parvis sicut majores (seriatæ) vix perspicue apparent. Long., $1\frac{1}{2}$ l; lat., $\frac{9}{10}$ l.

The markings on the elytra (which are constant in the six specimens I have seen) are very different from those of any other *Litocrus* known to me. Regarding the darker as the ground colour of the elytra there is presented a large common well-defined lighter area (which looked at with the head of the insect towards the observer resembles a side view of an open umbrella) with a narrowed prolongation on and around the suture attaining the scutellum. Hence the blotch in *lautus* is triangularly produced in the middle part (only) of its front, while in *plagiatus* the front of the blotch is triangularly emarginate all across its width and in *maculatus* triangularly *produced* all across its width; moreover in *maculatus* and *plagiatus* the actual suture is linearly infuscate so that there is a slight appearance of what I have called a common blotch being two spots divided on the suture from each other, and this is not the case in *lautus*. Disregarding colour and markings *lautus* is at once separable from the other two by the difference between the finer (confused) punctures of the elytral interstices and the larger (seriate) punctures of the alternate interstices being so slight that seriation is not distinctly traceable in any of the interstices.

N.S. Wales; Tamworth (Mr. Lea).

L. sparsus, sp. nov. Ovalis; nitidus; supra niger, capite antice et pronoti marginibus rufescentibus; subtus, cum antennis palpis pedibusque testaceo-brunneus; antennis fere ut *L. plagiati*, sed articulo ultimo quam 10us manifeste angustiori et quam 9us parum longiori; cetera fere ut *L. plagiati*,

sed elytrorum puncturarum seriebus minus subtilibus et interstitiis aliter punctulatis,—puncturis parvis sparsim inæqualiter et (in alternis interstitiis) puncturis multo majoribus seriatis insigniter impressis. Long., $1\frac{3}{5}$ l.; lat., 1 l.

Differs from the preceding two species by the absence of markings on its elytra and also by the elytral puncturation,—the systematic rows of close punctures consisting of distinctly larger punctures, the finer (confused) puncturation of the interstices being very evidently less close and less fine, and the seriate punctures of the alternate intestices being notably larger and more conspicuous. Also resembles *L. major*, Blackb., in size and colour; but that species is of wider build and less narrowed behind, the interstices of its elytra are notably more closely and evenly punctulate, the seriate punctures of its alternate interstices are considerably less conspicuous, and the eighth joint of its antennæ is much more elongate. *L. alternans*, Blackb., is smaller, of a different colour, with all the elytral puncturation (except the seriate punctures of the interstices) much finer and with the club of its antennæ very much narrower.

Victoria; Dividing Range.

L. perparvus, sp. nov. Ovalis; nitidus; minus convexus; niger, pronoto picescente, palpis antennis pedibusque rufo-testaceis; antennarum articulis 3° quam 4us dimidio longiori, 4° longiori quam latiori, 5° 4° æquali, 6°—8° inter se sat æqualibus brevibus transversis, 9° sat magno vix transverso, 10° quam 9us paullo breviori sat transverso, 11° quam 10us 9us que conjuncti paullo breviori nec angustiori; capite subtiliter confertim punctulato; prothorace fortiter transverso, supra fere ut caput punctulato sed minus crebre et puncturis multo majoribus nonnullis intermixtis, stria laterali fere ad apicem continua et breviter secundum marginem anticum producta; elytris seriatim subtiliter punctulatis (basin versus fere lævibus), interstitiis fere lævibus sed alternis puncturis distinctis inter se distantibus seriatim impressis; tarsis posticis sat robustis, articulo basali quam 2us circiter duplo longiori. Long., 1 l. (vix); lat., $\frac{3}{5}$ l.

This minute *Phalacrid* seems to be rather an isolated *Litocrus*. Its undersurface of dark color together with its small size separate it superficially from most of its congeners. In the species with which it is associated by the presence of well defined seriate puncturation on its alternate elytral interstices the lateral stria of the pronotum does not nearly follow the outline of the segment but turns obliquely inward and meets the front margin considerably within the front angle, so that the front corner is cut off into the form of a triangle, but in this species it nearly reaches the front margin before bending, and

then runs along for a short distance parallel with the front margin. It is perhaps nearest to *alternans*, Blackb., from which it differs however in size and colour, also in the lateral stria of its pronotum (as described above), also in its evidently less convexity (viewed from the side), also in the absence of puncturation on the elytral interstices (except the seriate puncturation of the alternate interstices). Its antennæ are like those of *alternans*,—differing from those of *major* by the very much shorter eighth joint and from those of *sparsus*, *plagiatus*, &c, by the much more elongate ninth joint and the much less dilatation of the club as a whole. Its small size, dark colour, and obsolete elytral puncturation render it very distinct from the Tasmanian *Litocrus* that I believe to be *brunneus*, Er.

Victoria (Dividing Range).

L. obscuricollis, sp. nov. Ovalis; sat brevis; nitidus; rufo-testaceus, capite pronoto (hoc ad latera, illo antice, dilutioribus) et in elytrorum disco postico umbris indeterminatis nigro-piceis; antennarum articulis 3° quam 4us duplo longiori, 4°—7° inter se sat æqualibus, 8° breviori transverso, 9° 10° que multo majoribus quam latiori sublongioribus, 11° quam præcedentes 2 conjuncti parum breviori; capite pronotoque lævibus; hoc fortiter transverso, stria ut præcedentis (*L. perparvi*); elytrorum sculptura vix manifesta (pone medium paullo magis perspicua), sub microscopio subtilissime striatis et in interstitiis sparsim subtilissime (alternis seriatim magis perspicue) punctulatis; tarsis posticis quam præcedentis minus robustis, articulo basali quam 2us vix duplo longiori. Long., 1 l.; lat., $\frac{7}{10}$ l.

In colouring extremely like *Parasemus victoriensis*, Blackb., but widely different structurally (*e.g.* by its much more slender hind tarsi, the basal joint of which is much longer, and by its metasternum much longer and narrower between the intermediate coxæ). From its described congeners the proportional length of its antennal joints (especially the sixth not transverse) readily distinguish it. It is perhaps generically distinct from *Litocrus*, but the uncertainty of M. Guillebeau's *Phalacrid* genera and especially the doubt mentioned by him (Ann. Soc. Ent. Fr. 1894, p. 279) as to the characters of the type of *Litocrus* render it unwise for the present to form new *Phalacrid* genera. My own opinion is that M. Guillebeau is wrong in his conjecture as to the tarsal characters of *L. brunneus*, Er.; he is certainly wrong if the Tasmanian species that I take to be *L. brunneus*, Er., is really that species; but as it is certainly *possible* that my identification is incorrect I do not feel justified in definitely disputing his conjectured characters. I have already discussed this matter and defined the aggregates of characters to which it appeared to

me at present necessary to limit oneself in distributing species among the Australian *Phalacrid* genera in Tr. Roy. Soc. S.A., 1895, pp. 205, &c. It is extremely difficult to discern the sutures between the joints of the hind tarsi in this species.

N.S. Wales; Mr. Lea (Clifton).

L. baccæformis, sp. nov. Ovalis; nitidus; obscure brunneus, antennis palpis pedibuset subtus capite prothoraceque testaceo-brunneis; antennarum articulis 3° quam 4us sat longiori, 4° 5° que inter se sat æqualibus haud transversis, 6°—8° latioribus transversis, 9° multo majori sat fortiter transverso ad basin modice angustato, 10° quam longiori duplo latiori, 11° quam 10us sublatiori, quam præcedentes 2 conjuncti haud multo breviori; supra vix manifeste punctulatus, sed elytrorum partibus lateralibus apicalibusque (sub lente forti) subtiliter seriatim punctulatis, in partibus dorsalibus puncturis nonnullis (sub lente forti) sparsissime impressis; tarsis posticis sat robustis, articulo basali quam 2us manifeste longiori. Long., $\frac{4}{5}$ l.; lat., $\frac{1}{2}$ l. (vix).

This minute *Phalacrid* has much the appearance of a small shining seed. From the other species almost devoid of puncturation it differs notably by its colour and shape. On the dorsal portions of the elytra a few moderately distinct scattered punctures are discernible under a Coddington lens, which appear to me to represent the seriate punctures of the interstices that are so conspicuous in some of the other species of the genus.

N.S. Wales (from Mr. Lea, Galston).

L. noteroides, Blackb. This species together with *pulchellus*, Blackb., and *coloratus*, Blackb., can hardly be considered genuinely congeneric with the species that I believe to be *L. brunneus*, Er., on account of *inter alia* the different sculpture of their pronotum and the greater length of the basal joint of their hind tarsi. They, however, out of all the Australian *Phalacridæ* known to me come nearest to what M. Guillebeau conjectures to be the typical form of *Litocrus*. Although I do not share his opinion, the matter is perhaps sufficiently uncertain to render it unadvisable at present to confer a new generic name on these species. I incline to regard *Litocrus* and *Micromerus* as synonyms, but even if they are not I do not think these species could confidently be referred to either of them,—certainly not to *Micromerus*.

Micromerus amabilis, Guilleb. I have still been unable to find among the many *Phalacridæ* from various parts of Australia that I have examined any specimens to which I can apply this name with any confidence. *L. tinctus*, Blackb., is no doubt very near it but differs in size. The smallest specimen that I have seen is Long., 1 l., whereas *amabilis* should be Long., $1\frac{1}{2}$ mm.

L. tinctus also has an infuscation on the elytra, of which there is no mention in the description of *amabilis*.

It seems desirable, in view of the additions that have been made to the genus *Litocrus* since 1895, to furnish a revised tabulation of the characters of the Australian species (omitting *amabilis*, Guilleb.),—as follows,—

A. The lateral stria of the pronotum reaches the front margin and there ends. Basal joint of hind tarsi about three times length of second joint.
  B. Elytra without transverse sculpture.
    C. Colour entirely testaceous ... ... noteroides, *Blackb.*
    CC. Elytra dark, with well-defined light markings ... ... pulchellus, *Blackb.*
  BB. Elytra with close transverse very fine scratch-like sculpture ... ... coloratus, *Blackb.*
AA. Not combining the characters attributed to "A."
  B. Joint 8 of the antennæ notably larger than in the species under "BB," and not transverse.
    C. Joint 9 of the antennæ scarcely wider than long. Puncturation of elytral interstices strong ... . major, *Blackb.*
    CC. Joint 9 of antennæ quite strongly transverse. Puncturation of elytral interstices very fine ... ... plagiatus, *Blackb.*
  BB. Joint 8 of antennæ quite small, transverse.
    C. Elytra with the second stria as strong as the subsutural one, and quite different from the others ... ... frigidus, *Blackb.*
    CC. Elytra not as in *frigidus*.
      D. Elytra without dorsal striæ (though usually with rows of punctures).
        E. Alternate interstices of elytra (especially the first and seventh) with rows of distant punctures).
          F. The non-seriate puncturation of interstices comparatively strong.
            G. This puncturation very sparse and irregular. Colour of elytra wholly black ... ... sparsus, *Blackb.*
            GG. This puncturation closer and even. Elytra with large well-defined pale markings ... lautus, *Blackb*
          FF. The non-seriate puncturation on the elytra much finer.
            G. Under surface testaceous - red. Elytra not uniformly black.
              H. Joint 9 of antennæ strongly transverse, wide at base. Form obtuse behind... ... brunneus, *Er.*
              HH. Joint 9 of antennæ less transverse and much narrowed at base. Form more narrowed behind.
                I. Upper surface non-iridescent; elytra dark, with a large common red spot ... ... maculatus, *Blackb.*

II. Upper surface iridescent; elytra unicolorous ... alternans, *Blackb.*
GG. Under surface dark; elytra black or dark piceous (size very small) ... ... perparvus, *Blackb.*
EE. Rows of distant punctures absent from (or scarcely traceable on) the alternate interstices.
F. Elytra with clearly traceable rows of punctures between the interstices.
G. Pronotum dark; elytra dark, with well defined pale markings ... læticulus, *Blackb.*
GG. Upper surface entirely pale testaceous except a little infuscation on the elytra ... ... tinctus, *Blackb.*
F. Elytra with practically *no* seriate puncturation on the disc.
G. Highest part of outline (viewed from the side) considerably in front of middle of elytra. Upper surface not even nearly unicolorous.
H. Elytra variably variegated with well-defined black and yellowish markings ... ... consors, *Blackb.*
HH. Elytra sanguineous, usually vaguely clouded with fuscous obscuricollis, *Blackb.*
GG. Highest part of outline (viewed from the side) behind middle of elytra. Upper surface unicolorous dark brown ... ... baccæformis, *Blackb.*
DD. The sculpture of the elytra includes numerous fine striæ.
E. Joint 9 of antennæ very strongly transverse, only moderately narrowed at base.
F. Elytral striæ and interstices scarcely perceptibly (excessively finely) punctulate ... ... Palmerstoni, *Blackb.*
FF. Elytral striæ and interstices very distinctly and not excessively finely punctulate ... ... Koebelei, *Blackb.*
EE. Joint 9 of antennæ much less strongly transverse, and very much narrowed at base... ... ... Sidneyensis, *Blackb.*

PARASEMUS.

To this genus I refer (as indicated in Tr. Roy. Soc., S.A., 1895, p. 206) all the Australian *Phalacridæ* presenting the following combination of characters, viz.,—mesosternum appearing (unless the prosternum be displaced from its natural position) as merely a narrow margin of the metasternal lobe, epistoma emarginate close to the eye (distinguishing it from the genus *Phalacrus*), metasternal lobe wide and short (not passing the front of the intermediate coxæ), basal joint of the hind tarsi shorter than the

second joint. I think it quite possible that the species presenting the above characters might with advantage be divided into several genera, but it would be better for such division to be made by someone having a larger collection of *Phalacridæ* from all parts of the world than I possess. Meanwhile no difficulty is likely to occur through my treating the genus in this manner if students referring to my descriptions will bear in mind the sense in which I use the name *Parasemus*. I do not think any of the species I call by the name are members of any other genus yet characterized.

P. adumbratus, sp. nov. Sat late ovalis, postice obtusus; nitidus; obscure rufo-brunneus, pronoti et elytrorum disco plus minusve infuscato; antennis sat robustis, articulis 3°—6° subcylindricis, 3° quam 4us dimidio longiori, 4° 6° que inter se sat æqualibus, 5° quam 4us nonnihil longiori, 7° nonnihil latiori (5° longitudine sat æquali), 8° quam 7us paullo breviori sed huic latitudine sat æquali, 9° quam 8us multo majori sat fortiter transverso, 10 9° sat simili sed paullo latiori, 11° turbinato quam præcedentes 2 conjuncti vix breviori vix latiori; clypeo subelongato antice sat angustato, ad apicem subtruncato; prothorace fortiter transverso, supra subtilissime crebre punctulato, puncturis nonnullis minus subtilibus impresso, stria laterali apicem haud attingenti sed intus oblique ad marginem anticum curva; elytris seriatim subtilius punctulatis (seriebus basin versus sat obsoletis), interstitiis puncturis quam serierum parum minoribus minus crebre impressis; tarsis posticis sat robustis, articulo basali quam 2us multo breviori; tibiis sat latis compressis. Long., 1¾ l.; lat., 1 l.

Of described species *P. torridus*, Blackb., is that to which the present one is nearest, but *P. torridus* is very much smaller, with its hind tibiæ shorter and wider, the difference in size between the seriate and interstitial punctures of its elytra considerably more marked, &c. In the present species the spine at the apex of the metasternal episterna is very strong and sharp, the apical joint of the maxillary palpi is scarcely shorter than the preceding two together and is subcylindric, and the front and intermediate tarsi are dilated. A specimen from the Dividing Range, Victoria, scarcely differs but seems to be a little more strongly punctured on the interstices of the elytra. In my tabulation of the species of *Parasemus* (Tr. R.S., S.A., 1895, p. 214) *P. adumbratus* finds its place beside *P. lateralis*, Blackb., and *victoriensis*, Blackb., from both of which it differs *inter alia multa* by the form of its clypeus.

N.S. Wales (Mr. Lea, Galston).

P. pallidus, sp. nov. Ovalis; nitidus; rufo-testaceus, elytris pallide brunneo-testaceis; antennis ut præcedentis (*adumbrati*) conformatis; capite brevi, clypeo antice rotundato; prothorace ut præcedentis; elytris fere ut præcedentis puncturatis sed puncturis multo magis subtilibus, punctularum seriebus nisi in disco medio vix manifestis; tibiis quam præcedentis minus late compressis; tarsis posticis minus elongatis. Long., 1 l.; lat., $\frac{3}{5}$ l.

Entirely of testaceous colour, inclining to reddish except on the elytra. The puncturation of the upper surface is very fine throughout and there is but little distinctly seriate arrangement of the punctures except on the middle part of the disc of the elytra. In general appearance it closely resembles *P. modestus*, Blackb., beside which is its place in my tabulation of the species of *Parasemus* (Tr. R.Soc., S.A., 1895, p. 214). It differs however from *modestus* by its hind tibiæ longer and less compresso-dilatate, and by the sculpture of its elytra, the seriate puncturation in *modestus* being even better defined behind the middle than on the disc and also being quite distinct on the lateral portions.

N.S. Wales.

PHALACRINUS.

P. compressus, sp. nov. Nitidus; subcircularis; antrorsum visus valde convexus (subcompressus); a latere visus modice convexus; nigropiceus, capite prothorace elytrorum lateribus pedibusque rufescentibus; antennarum articulo 9° longiori quam latiori quam 10us manifeste longiori, 11° 9° longitudine æquali; capite prothoraceque fere lævibus; scutello fortiter transverso; elytris subtiliter sat æqualiter striatis, striis dorsalibus vix manifeste (lateralibus subtiliter perspicue) punctulatis, interstitiis subtilissime vix manifeste punctulatis. Long., $1\frac{1}{5}$ l.; lat., 1 l.

Resembles in colouring the typical form of *P. notabilis*, Blackb., but is of much more circular form. Looked at from in front the sides are much less vertical. The apical joint of the antennæ is much shorter in comparison with the ninth joint. The lateral striæ of the elytra are very much finer and very much more finely punctulate. Probably the colouring is variable. Viewed from the side there is an evident appearance of the apex of the elytra being sub-spiniform, which is caused, however, merely by the somewhat expanded form of the extero-apical portion.

N.S.W. (Blue Mountains).

P. umbratus, sp. nov. Nitidus; modice latus; obovatus, postice minus acuminatus; antrorsum visus valde convexus; a latere visus modice convexus; testaceo-brunneus, elytris plus minusve fusco-umbratis; antennarum articulo 9° 10°

longitudine sat æquali quam 11us sat breviori; capite prothoraceque lævibus; scutello fortiter transverso; elytris subtiliter sat æqaliter striatis, striis vix perspicue punctulatis, interstitiis fere lævibus. Long., 1 l.; lat., $\frac{3}{8}$ l.

The scarcely visible puncturation of the lateral striæ of its elytra separates this species from all its previously described congeners except *obtusus*, Blackb., from which latter it differs *inter alia* by its very much greater convexity and the ninth joint of its antennæ notably shorter as compared with the tenth. Mr. Lea has also forwarded a *Phalacrinus* from W. Australia which is extremely close to *P. umbratus* but apparently distinct, as the apical joint of its antennæ is considerably more elongate. It is, however, not in fit condition for description, its elytra being open and the wings exposed, so that its shape cannot be determined.

N.S Wales (Dalmorton, Mr. Lea).

P. comis, Blackb. Since describing this species I have met with examples both in Victoria and Tasmania considerably larger than the type, the largest Long., $1\frac{1}{2}$ l.

P. navicularis, sp. nov. Nitidus; modice, latus; postice fortiter acuminatus; antrorsum visus modice convexus; a latere visus subplanatus; testaceo-brunneus, elytris piceo-umbratis; antennarum articulo 9° fere transverso quam 10us vix longiori; 10° transverso; 11° quam 9° fere duplo longiori; capite prothoraceque lævibus; scutello fortiter transverso; elytris subtiliter striatis, striis vix perspicue punctulatis; interstitiis subtilissime punctulatis. Long., $1\frac{1}{8}$ l.; lat., $\frac{4}{5}$ l.

The elytra of the unique type of this species are almost wholly piceous, a common somewhat diamond-shaped ill-defined testaceous spot being placed behind the suture, and the disc of the prothorax also is infuscate. Probably however the infuscation varies. In shape the species resembles *australis*, Blackb., but is a little wider and differs *inter alia* by the absence of distinct punctures in its elytral striæ, and by the apical joints of its antennæ, the ninth joint in *australis* being evidently longer than wide, evidently longer than the tenth (which however is scarcely transverse), and scarcely shorter than the eleventh.

Victoria (Dividing Range).

The following table shows characters by which the described species of *Phalacrinus* may be distinguished *inter se*:—

A. Lateral striæ of elytra very much more deeply impressed than in the other species ... ... notabilis, *Blackb.*

AA. Lateral striæ of elytra normal.

B. Lateral striæ of elytra very distinctly punctulate.

C. Form nearly circular,—obtuse behind.

D. Form (viewed from in front) extremely convex (compressed) ... ... compressus, *Blackb.*

DD. Form (viewed from in front) but little convex ... ... rotundus, *Blackb.*
CC. Form much more elongate,—acuminate behind.
D. Form (viewed from in front) very strongly convex. Elytral interstices very evidently punctulate ... ... comis, *Blackb.*
DD. Form (viewed from in front) feebly convex. Elytral interstices scarcely punctulate ... ... australis, *Blackb.*
BB. Elytra without any distinctly punctulate striæ.
C. Joints 9 and 10 of antennæ of equal length.
D. Form strongly acuminate behind. Head extremely wide ... ... navicularis, *Blackb.*
DD. Form much more obtuse behind. Head much narrower ... ... umbratus, *Blackb.*
CC. Joint 9 of antennæ very evidently longer than 10 ... ... obtusus, *Blackb.*

NITIDULIDÆ.

NOTOBRACHYPTERUS.

N. lutescens, sp. nov. Ovalis; breviter pubescens; minus nitidus; totus luteo-pubescens, capite prothoraceque nonnihil rufescentibus; capite æquali confertissime asperatim (quam *Brachypteri gravidi*, Illig., multo magis crebre multo magis rugulose) punctulato; prothorace quam elytra vix angustiori, fortiter transverso, antice angustato, confertim subasperatim minus fortiter (quam *B. gravidi* magis confertim magis leviter) punctulato; scutello sat magno (quam *B. gravidi*, Illig., et *Notobrachypteri australis*, Blackb., manifeste minore), ut pronotum punctulato; elytris quam prothorax fere ut 4 ad 3 longioribus, confertim sat leviter vix asperatim punctulatis; propygidii margine postico (exempli typici) leviter emarginato. Long., 1 l.; lat., $\frac{3}{5}$ l. (vix).

Among the species resembling it in size and colour this species is recognisable by the very close strong asperate puncturation of its head. The surface of its clypeus is without impressions; the puncturation of its pronotum is more lightly impressed than is usual in the genus; the hind outline of its propygidium is continuously (though lightly) emarginate all across (not angulate in the middle as in *creber*, Blackb., nor sinuate as in *australis*, Blackb.).

N.W. Australia; taken by Mr. E. Meyrick.

N. crassiusculus, sp. nov. Ovalis; breviter pubescens; sat nitidus; lurido-brunneus, capite pronoto et elytrorum partibus scutellaribus marginalibusque variabiliter infuscatis, antennis pedibus prosterno et pronoti marginibus lateralibus testaceo-brunneis; capite æquali subgrosse sub-

rugulose minus crebre (*Brachyptero gravido*, Illig. comparato) punctulato; prothorace quam elytra paullo angustiori, fortiter transverso, antice angustato, ut caput punctulato; scutello magno (fere ut *B. gravidi*) ut caput punctulato; elytris quam prothorax fere ut 3 ad 2 longioribus, quam pronotum magis leviter magis crebre (nec magis subtiliter) punctulatis; propygidii margine postico fortiter sinuato. Long., 1 l.; lat., $\frac{3}{8}$ l.

Perhaps nearest to *N. australis*, Blackb., which it resembles in its stout robust build, differing however in its darker colouring (especially on the under surface) and the notably coarser puncturation of its upper surface.

Tasmania; also Victoria (Dividing Range).

N. (*Brachypterus*) *testaceus*, Bohem. The specimen referred to by me in a former memoir (Tr. R.S., S.A., 1892, p. 28) as possibly this species is that which I have now described as *N. lutescens*. Unfortunately Bohemann mentions few characters of value to distinguish *testaceus* from its subsequently described congeners, but if he had had *N. pubescens* before him I think he would certainly have called its pronotum "creberrime" rather than "sat crebre" punctulatum; moreover the extreme remoteness *inter se* of the places of capture renders it unlikely that the two species are identical. M. Grouvelle has sent me a specimen of *N. bifoveatus*, Blackb., as *testaceus*; it is from Adelaide (the known habitat of *bifoveatus*) and has the two foveæ on the head extremely distinct. Bohemann describes the head of *testaceus* somewhat fully but does not mention any foveæ. I suspect that there is a *Notobrachypterus* of testaceous colour found near Sydney (distinct from both *bifoveatus* and *lutescens*) which I have not seen.

N.? (*Brachypterus*) *metallicus*, Reitt I have not seen any specimen to which this name can be referred.

N. pauxillus, sp. nov. Ovalis; breviter pubescens; sat nitidus; obscure brunneus, antennis pedibusque testaceis; capite antice transversim arcuatim leviter impresso, sparsius minus fortiter punctulato; prothorace quam elytra vix angustiori, fortiter transverso, antice minus angustato, fere ut caput (sed disco postice magis subtiliter magis sparsim) punctulato; scutello minore, antice sparsius subtilius punctulato, postice lævi; elytris quam prothorax fere ut 3 ad 2 longioribus, sat crebre leviter nec subtiliter (quam *B. gravidi*, Illig. multo magis leviter minus crebre, fere ut *N. bifoveati*, Blackb., sed magis leviter) punctulatis. Long., $\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

The comparatively small scutellum with its hinder part smooth and the punctures of its front part sparse and somewhat fine distinguishes this species from most of its allies. *N. lilliputanus*

and *lutescens* resemble it in this respect, but have their puncturation throughout (including that of the scutellum) very much finer still. In the present species the punctures of the scutellum are scarcely so fine as in the European *B. gravidus* and very much less close. This is the insect that in a former paper (Tr. R.S., S.A., 1892, p. 38) I called a var. of *N. nitidiusculus*. I now find that besides the notable colour differences its head is less even, and less closely punctulate, and that its general puncturation is less strongly impressed.

W. Australia; taken by Mr. Meyrick.

The species of *Notobrachypterus* are now sufficiently numerous to call for a tabular statement of their distinctive characters, as follows:—

A. Pronotum very distinctly (in no instance very finely) punctulate.	
B. Hindmargin of propygidium strongly and angularly produced in the middle ...	creber, *Blackb.*
BB. Hindmargin of propygidium at most sinuate.	
C. Upper surface black (puncturation of head a little closer than in *australis*) ...	nitidiusculus, *Blackb.*
CC. Upper surface brown or testaceous.	
D. Puncturation of head fine and close (about as in the European *Brachypterus gravidus*, Illig. but more asperate ...	australis, *Blackb.*
DD. Puncturation of head very much closer, quite confluent	lutescens, *Blackb.*
DDD. Puncturation of head very distinctly less close than in *australis*.	
E. Pronotum closely punctulate throughout, continuously with scutellum.	
F. Colour of body dark brown above and beneath; elytra more coarsely and closely punctulate	crassiusculus, *Blackb.*
FF. Colour of body testaceous or rufo-testaceous above and beneath; elytra less coarsely and closely punctulate	bifoveatus, *Blackb.*
EE. Pronotum about base and front of scutellum quite sparsely punctulate; scutellum lævigate behind ...	(? testaceus, *Bohem.*) pauxillus, *Blackb.*
AA. Pronotum very finely (scarcely distinctly) punctulate	lilliputanus, *Blackb.*

BRACHYPEPLUS.

This genus contains a good many species that probably appear under two names in Masters' Catalogue. *B. Haagi*, Reitter, must, as I have already pointed out (Tr. R.S., S.A., 1894, p. 203) almost certainly be regarded as a synonym of *Murrayi*, Macl. I have no doubt that *B. blandus*, Murr., is a mere variety (scarcely deserving to be called even that) of *B. binotatus*, Murr. It is really difficult to determine from the descriptions what the author regarded as the difference between the two species. I

can discover nothing except that *blandus* is a little wider than *binotatus* (no doubt due to sex—the male *Brachypepli* are usually narrower than the females), has a more rufous club to its antennæ, and has more rufous colouring on its abdomen. I have before me a large number of specimens from various parts of Victoria (the locality cited for both species) among which I find slight variable differences such as Murray mentions, and including both forms, but I can see no reason whatever to separate them specifically. *B. castanipes*, Murr., the author thinks is perhaps only the Victorian form of the Tasmanian *B. planus*, Er., and suggests that his readers may consider it a variety. The only difference he definitely specifies is that *B. castanipes* is smaller than *planus*. I have collected specimens in Victoria and Tasmania which are undoubtedly all *B. planus*, and there is no distinct closely allied species among them. They vary considerably in size. The above corrections of nomenclature reduce the number of described Australian *Brachypepli* to six (viz., *auritus*, Murr.; *basalis*, Er.; *binotatus*, Murr.; *Macleayi*, Murr.; *Murrayi*, Macl.; and *planus* Er.). I know all these species except *Macleayi*, Murr., a name that I cannot identify with any insect. Most of the characters Murray cites in his description would apply to several species, but the colouring of the elytra seems to be different from that of any other *Brachypeplus* I have seen (piceous, with a narrow basal margin of red). I conclude therefore that *Macleayi* is not before me. *B. auritus*, Murr., is so unlike the other species in general appearance and in the structure of its head that it ought I think to be formed into a new genus (not merely a subgenus, as Murray suggests) but for the present it is perhaps better to let that question stand over, more especially as I have before me several other species that differ from *B. planus*, &c., in isolated structural characters on the value of which from a generic point of view I am not prepared to give a decided opinion, not having many *Brachypepli* from other parts of the world for comparison. I will therefore on the present occasion merely describe these new species placing them provisionally in *Brachypeplus* and furnish a tabulation of the distinctive characters of the species that must now stand as *Brachypepli*. The Australian *Carpophilides* known to me I regard as all belonging to *Brachypeplus* and *Carpophilus*, which may be readily distinguished *inter se* by the form of the labrum (among other characters), that organ being in *Carpophilus* deeply emarginate in front while in *Brachypeplus* it is nearly straight or slightly rounded. It should be noted that immature examples of *Brachypepli* are somewhat common in collections, and these are usually of an uniform ferruginous colour.

B. Olliffi, sp. nov. Elongatus; subparallelus; minus latus

depressus; parum pubescens; testaceus, elytris postice infuscatis; supra confertim subtiliter (quam *B. planus*, Er., sat multo magis subtiliter) punctulatus; capite (præsertim in parte mediana) granulis insignibus minus crebre instructo; prothorace ut caput granulato, transverso, antice modice angustato emarginato, angulis anticis acutis posticis acute rectis, marginibus lateralibus ciliatis; elytris quam prothorax vix latioribus quarta parte longioribus, vix manifeste striatis, inæqualiter obtuse leviter costulatis; abdominis segmenti basali elytris tecto, ceteris apertis.

Maris segmento dorsali 5° apice truncato, 6° brevi transverso. Long., $3\frac{4}{5}$ l.; lat., 1 l.

The large size, depressed form, and abdomen with only the first dorsal segment covered by the elytra suggest a doubt whether this species might not be regarded as the type of a new genus *Brachypeplus* as characterised by Lacordaire has not more than three dorsal segments exposed, but there are Australian species (e.g., *binotatus*, Murr.) in which a portion of the second segment is exposed dorsally. In the present insect the exposed abdomen is distinctly longer than the elytra. I do not think the abdomen is artificially drawn out, but as I have only a single specimen I cannot be quite certain on the point. Apart from the characters just mentioned this species is at once distinguishable from its described Australian allies by the conspicuous little granules thinly dispersed over its head and pronotum. The outline of its prothorax is scarcely different from that of the prothorax of *B. planus*, Er., but the sides are slightly more rounded near the front.

S. Australia; Eyre's Peninsula.

B. wattsensis, sp. nov. Sat elongatus; sat parallelus; sat angustus; minus convexus; pubescens; rufo-testaceus, capite pronotoque (hujus lateribus exceptis) rufo-piceis, elytrorum sutura et parte postica tertia infuscatis vel nigricantibus; supra minus nitidus; capite pronotoque creberrime sat aspere (quam *B. basalis*, Er., fere magis crebre) punctulatis; hoc transverso, antice haud perspicue angustato vix emarginato, marginibus lateralibus ciliatis, angulis anticis obtusis posticis rectis, lateribus sat rectis; elytris quam prothorax vix latioribus tertia parte longioribus, fere ut *B. binotati*, Murr. (subtiliter striatis, interstitiis anguste lineatim prominentibus, sed his quam *B. binotati* paullo magis prominentibus); abdominis segmentis basalibus 2 elytris tectis. Long., 2 l.; lat., $\frac{3}{5}$ l.

The Australian *Brachypepli* are so little variable in colour and markings that this insect might perhaps be reliably distinguished

from its Australian congeners by its entirely testaceous abdomen in conjunction with the form of the luteous portion of its elytra which occupies the anterior portion to somewhat behind the middle, the suture however being widely but not very strongly infuscate; the hind part of the elytra for nearly a third part of its length is nearly black. Of the species having the lateral margins of the pronotum ciliate those most resembling *wattsensis* are *basalis*, Er., and *binotatus*, Murr.; from the former it differs *inter alia* by its prothorax scarcely wider at the base than in front and from the latter by the straightness of the sides of the prothorax and the considerably more crowded puncturation of the upper surface of that segment. Compared with *B. Murrayi*, Macl. (identified by Mr. Lea by comparison with the type) the pronotum is considerably more closely punctulate and less narrowed in front, &c., &c.

Victoria; Watts River district.

B. Cowleyi, sp. nov. Minus elongatus; modice latus; sat parallelus; minus convexus; pubescens; subnitidus; piceus, elytrorum humeris luteis (horum colore retrorsum producto sed gradatim obscurato), antennis pedibusque fulvis; capite crebre (fere ut *B. basalis*, Er.), pronoto subfortiter minus crebre (quam *B. basalis* multo minus subtiliter multo minus crebre), abdomine fere ut pronotum, punctulatis; prothorace transverso, antice sat fortiter (ut *B. basalis*) angustato leviter emarginato, marginibus lateralibus ciliatis, angulis anticis obtusis posticis subacutis retrorsum inclinatis, lateribus leviter arcuatis; elytris quam prothorax vix latioribus tertia parte longioribus, abdominis segmentum 2um vix omnino tegentibus, punctulato-striatis, interstitiis planatis uni-seriatim sat fortiter punctulatis. Long., $1\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

The colouring of the elytra is not much different from that of the preceding species (*B. wattsensis*). In general appearance this species resembles *B. basalis*, Er., and *binotatus*, Murr., from both of which it is very distinct by the stronger and sparser puncturation of its pronotum and especially of the dorsal segments of its abdomen and by the uniformly flattened interstices of its elytra. The outline of its prothorax is similar to that of *B. basalis*. Compared with *B. Murrayi*, Macl., *inter alia* the abdomen is very much more strongly punctulate.

Queensland (sent from Cairns by the late Mr. Cowley).

B. Koebelei, sp. nov. Sat elongatus; minus latus; parallelus; minus convexus; pubescens; subnitidus; piceo-niger, humeris luteis, antennis pedibusque fulvis; capite pronotoque subfortiter minus crebre (ut *B. Cowleyi* pronotum), abdominis segmento 3° ut pronotum 4° magis subtiliter, punctulatis; prothorace transverso, antice sat fortiter (tu

B. basalis, Er.) angustato leviter emarginato, marginibus lateralibus ciliatis, angulis anticis obtusis posticis subacutis retrorsum inclinatis, lateribus leviter arcuatis; elytris quam prothorax haud latioribus vix tertia parte longioribus, abdominis segmentum 2um nullo modo tegentibus, punctulato-striatis, interstitiis planatis uni-seriatim sat fortiter punctulatis. Long., $1\frac{3}{5}$ l.; lat., $\frac{1}{2}$ l.

The markings of the elytra consist of a small but very conspicuous red patch on each shoulder. The species is somewhat close to the preceding (*B. Cowleyi*) but is smaller and narrower and notably more parallel, and is readily distinguishable also by the very evidently less close puncturation of its head and the much finer puncturation of the dorsal surface of the fourth segment of its abdomen. Compared with *B. Murrayi*, Macl., *inter alia* the pronotum and head are considerably less closely punctulate.

North Queensland (given to me by Mr. Koebele).

B. barronensis, sp. nov. Sat elongatus; minus latus; minus convexus; pubescens; minus parallelus (abdomine a basi retrorsum angustato); castaneus, elytris postice plus minusve infuscatis; capite prothoraceque crebre minus subtiliter (haud multo aliter quam *B. plani*, Er.), abdomine minus fortiter multominus crebre, punctulatis; prothorace transverso, antice sat fortiter (ut *B. basalis*, Er.) angustato parum emarginato, marginibus lateralibus haud ciliatis, angulis anticis obtusis posticis fere rectis (nec acute) haud retrorsum inclinatis, lateribus leviter arcuatis; elytris quam prothorax (maris vix, feminæ paullo) latioribus tertia parte longioribus, abdominis segmenti 3^{i} partem basalem tegentibus, substriatis, interstitiis planatis vix prominentibus minus perspicue punctulatis.

Maris (?) abdominis segmento 5° ad apicem late rotundato-truncato, segmento 6° brevissimo; feminæ segmento 5° magis elongato ad apicem minus late rotundato. Long., $1\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

Readily distinguishable from its previously described Australian congeners by the non-ciliate lateral margins of its pronotum and by the hind angles of that segment being (not sharply but) bluntly right angles and not directed hindwards. I think the two specimens before me are male and female but the external sexual characters in that case are very slight (as seems to be the case with most of the Australian *Brachypepli*). In the specimen that I take to be a male the fifth dorsal segment of the abdomen is shorter and blunter than in the other specimen and beyond it there is (what looks like) an extremely minute

appended segment; the dorsal surface of the abdomen is, moreover, distinctly more nitid than in the other specimen.

N. Queensland (given to me by Mr. Koebele).

B. kemblensis, sp. nov. Sat elongatus; sat latus; minus convexus; pubescens; sat parallelus; brunneus vel brunneo-testaceus, capite prothorace (lateribus exceptis) et elytrorum dimidia parte postica varie quam ceteræ partes plus minusve obscurioribus; capite crebre fortiter, prothorace fortiter minus crebre, abdomine minus crebre minus fortiter, punctulatis; prothorace transverso, antice modice angustato parum emarginato, marginibus lateralibus haud ciliatis, angulis anticis obtusis posticis rectis haud retrorsum inclinatis, lateribus leviter arcuatis; elytris quam prothorax sublatioribus circiter tertia parte longioribus (feminæ quam maris paullo longioribus), abdominis segmentum 2um vix tegentibus, punctulato-striatis, interstitiis planatis vix prominentibus minus perspicue punctulatis.

Maris abdominis segento 5° ad apicem truncato, 6° bene perspicuo transverso; feminæ segmento 5° ad apicem declivi producto-rotundato. Long., 1⅓ l.; lat., $\frac{7}{10}$ l. (vix).

The conspicuous characters of this species are the absence of ciliæ on the lateral margins of its pronotum and the strong puncturation of that segment, which might almost be called coarse; it is considerably more so than in any other Australian *Brachypeplus* known to me (except *auritus*, Murr., in which it is altogether of a different type). The pronotum has indication of a ongitudinal median line—more distinct in some specimens nan n others. The colour varies a little, particularly on the pronotum which is infuscate or not and on the abdomen and under surface which are of different shades of testaceous or brown.

N.S. Wales (Mount Kembla); given to me by Mr. Hamilton.

HAPTONCURA.

H. ocularis, Fairm. I have in my collection a specimen given me by Mr. Koebele taken in N. Queensland, which agrees perfectly with Fairemaire's description of this Tahitian insect. It is certainly identical with examples from the Hawaiian Islands (introduced there, no doubt) of *H. tetragonus*, Murr (a species from Ceylon). In Trans. Roy. Dublin Soc, 1885, p. 231, the probability of the identity of *H. tetragonus* with the previously described *H. ocularis* is indicated, a probability that is increased by the occurrence in Queensland of the specimen before me.

SORONIA.

S. simulans, Blackb. I have received from Queensland a specimen which seems to differ from the type of this species only

in being smaller (Long. 2¼ l.) and of a very pale brown colour. It is not in very good condition, and the examination of fresh examples might show it to be a distinct species.

ÆTHINODES.

This genus is extremely close to *Idæthina* and *Lasiodactylus*; indeed I feel considerable doubt as to whether either it or *Idæthina* can be regarded as genuinely distinct from *Lasiodactylus*. It undoubtedly differs from the other two in having the inner outline of the basal portion of the claws distinctly (though not strongly) dentate. In *Idæthina* this portion is very distinct though not dentate on its inner margin (so that the claws are not in the strict sense simple); in *Lasiodactylus* it is all but non-existent. *Idæthina* is of manifestly narrower and more cylindric form than the other two. Beyond these differences I know not where to find distinctive characters. In his monograph of the *Nitidulidæ* Reitter attaches very great importance to the form of the claws as a generic character, and therefore it is not possible to annex *Æthinodes* to *Lasiodactylus* without traversing Reitter's system of classification to a very serious extent, but it certainly appears to me open to criticism.

IDÆTHINA.

I. cincta, Blackb. Since I described this species I have received through the courtesy of M. Grouvelle a specimen of *I. Deyrollei*, Reitt., and find that my species differs from the typical one, as I supposed, in the striation of the elytra which is entire in *cincta* and limited to the lateral parts in *Deyrollei*. There is not much difference, however, in the puncturation of the pronotum. The two are undoubtedly congeneric.

Remarks on this genus will be found above under *Æthinodes*.

MACROURA.

The following is a tabulation of the characters of the Australian species of this genus, so far as I know them :—

A. External margin of front tibiæ armed at the apex.	
B. The armature consists of two equal acute small teeth separated by a semicircular somewhat wide interval	deceptor, *Blackb.*
BB. The armature consists of two large unequal subcontiguous teeth	bicalcaratus, *Blackb.*
BBB. The armature consists of a feeble prominence which is more or less bifid at its apex.	
C. Pronotum excessively finely punctulate, the punctures confluent and asperate	brunnescens, *Reitt.*
CC. Pronotum notably less finely and less closely punctulate	concolor, *Macl.*
AA. External margin of front tibiæ unarmed ...	inermis, *Blackb.*

M. brunnescens, Reitt. I have no doubt that I have correctly identified this species, which so far as my experience goes is the only widely distributed Australian member of the genus. I have examples from Central Australia, W. Australia, and S. Australia. In one particular it does not strictly agree with the description, which calls the "head and prothorax" "*confertissime subtiliter subruguloso-punctata.*" This expression applies quite satisfactorily to the pronotum of the specimens before me, but the head is distinctly less closely, less finely, punctulate. This discrepancy does not affect my confidence in the identification, inasmuch as I fiud that Reitter in his descriptions of species of this genus did not (in any instance before me) distinguish between the puncturation of the head and the pronotum, whereas I can scarcely find a *Macroura* in which there is not a distinct difference between those two segments in respect of puncturation. Moreover, the difference is more marked in the males than in the females. Furthermore, Reitter's descriptions in this genus are shown to be somewhat hastily drawn up by his not (in the instances before me) referring to the armature of the extero-apical portion of the front tibiæ which is a most valuable character for distinguishing the species. I have made this note because *brunnescens* appears to be decidedly the most convenient species wherewith to compare other Australian members of the genus (as being a comparatively common and a very well marked species) and therefore it is desirable that there should be no doubt about which is the insect that I refer to under that name. It is easily recognised among the *Macrouræ* known to me by its lurid brown elytra (in contrast to the nigro-piceous general colour of the upper surface), the extremely fine and close sub-asperate puncturation of its pronotum and the extero-apical corner of its front tibiæ having a small bifid prominence. It is very variable in size.

M. nigra, Reitt. In some previous remarks on this species (T.R.S., S.A., 1891, p. 109) I gave my reasons for thinking *M. Baileyi*, Blackb., distinct from it. After examination of *Macrouræ* from various parts of Australia which were not then before me I incline to reverse my former judgment, which was based chiefly on Reitter's statement that the apex of the elytra in *M. nigra* is truncate. Reitter, however, regards the truncation of the elytra as a generic character, and qualifies it by the statement (in the diagnosis of the genus) that the apex of the elytra is rounded at the angles. His statement concerning the elytra of *M. nigra*, therefore, amounts to no more than that their form is normal and does not necessarily imply that they are more abruptly truncate than those of their congeners. Reitter also (in his notes on the species) qualifies his statement

(in his diagnosis) that the pubesence of *M. nigra* is black. The size (which I also referred to) is not a satisfactory distinction alone, and therefore, as it seems improbable that *M. nigra* is not among the species before me, I am of opinion that *M. Baileyi* is identical with Reitter's species. Unfortunately, there is still further entanglement in the synonymy of this insect, for (as noted T.R.S, S.A., 1894, p. 204, and 1895, p. 31). I received it from Mr. Lea subsequently to my description of *Baileyi* under the name *Carpophilus obscurus*, Macl. (on a supposed comparison with Macleay's type) and too hastily adopted the correction. Afterwards Mr. Masters sent it to me as *Nitidula concolor*, Macl. This caused me to look carefully into the matter, and I found that Masters' identification is correct, and that Mr. Lea must have compared it with a specimen which was not the real type of *C. obscurus*, Macl., as it does not at all agree with Macleay's description. The synonymy, therefore, appears to be as follows:

M. (*Nitidula*) *concolor*, Macl.
nigra, Reitter.
Baileyi, Blackb.
obscurus (*Carpophilus*), Blackb., T.R.S., S.A., 1894, p. 204, nec. Macl.

M. densita, Reitt. This species is said to be common to Ceylon and Australia. It seems to be a very small *Macroura* notable especially by the extremely close puncturation of its pronotum and the red colour of its front tibiæ in contrast to the colour of its other legs. I have seen nothing like it and suspect that it is erroneously quoted as Australian.

M. (*Nitidula*) *latens*, Blanch. The description of this insect is almost certainly that of a *Macroura*, but is not precise enough to identify it with any insect known to me. Any one of three or four species may with about equal probability be that on which Blanchard founded his description.

M. bicalcarata, sp. nov. Fem. Late ovalis; vix nitida; fulvo- vel cinereo-pubescens; piceo-nigra, antennis pedibusque rufo-brunneis, illarum articulo ultimo infuscato; capite creberrime minus subtiliter (quam *M. brunnescentis* magis crebre minus subtiliter), pronoto crebre subtilius (a parte antica retrorsum gradatim minus subtiliter), quam *M. brunnescentis* minus subtiliter) punctulatis; prothorace fortiter transverso, antice angustato, lateribus arcuatis, angulis posticis (superne visis) subacutis retrorsum inclinatis, a latere visis obtusis; elytris confertim inæqualiter (quam *M. brunnescentis* magis perspicue minus confertim) striatis, striis inæqualiter punctulatis, interstitiis angustis haud punctulatis; tibiis anticis extus ad apicem dentibus binis magnis armatis, his fere contiguis. Long., 2 l.; lat., $1\frac{1}{10}$ l.

Readily distinguishable from all its congeners known o me by the two teeth at the external apex of its front tibiæ. These teeth are larger than those on the tibiæ of the other *Macroura* known to me and are almost in contact with each other.

Queensland; Charters Towers.

M. inermis, sp. nov. Late ovalis; sat nitida; fulvo-pubescens; nigra, antennis pedibusque rufis; capite subfortiter (maris quam feminæ minus crebre), pronoto crebre subtilius (quam præcedentis, *M. bicalcaratæ*, haud multo aliter) punctulatis; prothorace fortiter transverso, antice angustato, lateribus arcuatis, angulis posticis superne visis subacutis retrorsum inclinatis, a latere visis sat rectis; elytris sat æqualiter minus confertim punctulato-striatis, interstitiis planis nitidis minus angustis subrugulosis; tibiis anticis inermibus. Long., $1\frac{1}{8}$—$1\frac{1}{2}$ l.; lat., $\frac{7}{10}$—$\frac{4}{5}$ l.

At once separated from its congeners known to me by its unarmed front tibiæ, their extero-apical angle being simply acute (scarcely prominent). The scratch-like striæ of its elytra are less numerous (there are about 20 of them on each elytron) than in any other *Macroura* known to me except *deceptor*, Blackb., and they are better defined and more evenly punctulate than in any of its congeners that I have seen.

Queensland, Cairns; given to me by Mr. Koebele.

CRYPTARCHA.

C. obscurior, sp. nov. Ovata; minus convexa; sat nitida; pubescens; ferruginea, pronoti disco et elytrorum sutura antice late infuscatis, macula indeterminata infuscata sublaterali in elytris posita; capite pronotoque crebre subfortiter punctulatis; prothorace transverso, antice angustato, lateribus arcuatis, margine antico emarginato; elytris sat æqualiter punctulato-striatis, interstitiis planis, sutura (nisi juxta apicem) haud elevatis. Long., $1\frac{1}{4}$ l.; lat., $\frac{3}{5}$ l.

Probably variable in respect of colour and markings. Allied to *C. depressa*, Grouv., from which it differs *inter alia multa* by the entire absence of any inequality on the pronotum, by the interstices of its elytra all absolutely flat, by the suture of its elytra perfectly flat (except close to the apex) and by the striæ of its elytra very much more evenly impressed (*e.g.*, the fourth stria not inclined obliquely towards the suture till quite near its apex). The only irregularity in the striation consists in the two striæ next the suture on each elytron being subobsolete and represented by little more than their punctures, the seriation of which is somewhat disturbed and runs into a single line considerably before the apex; the third stria is traceable almost to

the apex. In the unique type the basal half of the pygidium is covered by the elytra.

Victoria (Dividing Range).

MONOTOMIDÆ.

MIMEMODES.

M. Koebelei, sp. nov. Minus elongatus; minus nitidus; parce breviter albido-setosus; testaceo-brunneus, capite prothoraceque rufescentibus; capite latissimo, trans oculos valde prominentes quam prothorax magis lato, parce subtiliter punctulato, lateribus supra oculos alte reflexis; antennis sat brevibus, 10-articulatis (articulo 11° vix manifesto), clava quasi 1-articulata, articulis basali sat magno 2° globoso, 3°—9° parvis; prothorace leviter transverso, quam elytra sublatiori, antice quam postice latiori, subfortiter minus crebre (parte mediana haud punctulata excepta) punctulato, lateribus crenulatis fere rectis, angulis obtusis; scutello sat parvo, elongato-triangulari; elytris pygidium vix attingentibus, postice rotundato-truncatis, leviter striatis, striis punctulatis, interstitiis planis sat latis; tarsis 4-articulatis, articulis 1° 2° que brevibus dilatatis, 3° minutissimo, 4° quam ceteri conjuncti longiori; unguiculis inermibus. Long., 1 l.; lat., $\frac{2}{3}$ l.

This species does not seem to differ in its structural characters from the other two species of *Mimemodes* (*M. japonus*, Reitt., and *laticeps*, Macl.) in my collection, but it is of comparatively broader and shorter form than either of them, with more prominent eyes than *japonus* (the eyes of *laticeps* are very much less prominent) and is very different from both by the sides of its head very strongly reflexed (almost like crests) above the eyes.

N. Queensland; given to me by Mr. Koebele.

TROGOSITIDÆ.

LEPERINA.

L. (*Peltis*) *moniliata*, Pasc.? Oblonga; nigro-picea, labro palpis antennis pedibusque plus minusve rufescentibus, prothoracis elytrorumque marginibus lateralibus (margine summo excepto) late concinne rufis, pronoto maculis 8 elytris singulis maculis circiter 20 (maculis squamis coccineis coloratis) ornatis; supra subæqualiter sat fortiter subrugulose punctulata; prothorace sat fortiter transverso, antice fortiter emarginato, pone marginem anticum foveis 2 profundis impresso, lateribus leviter æqualiter arcuatis, angulis anticis fortiter productis posticis subrectis; elytris 4—costulatis. Long., $3\frac{1}{2}$—$4\frac{1}{2}$ l.; lat., $1\frac{2}{5}$—$1\frac{4}{5}$ l.

In a fresh specimen the scales forming the spots on the upper

surface are of a very bright scarlet colour; those on the pronotum are a pair in the discal foveæ, a corresponding pair on the basal margin and one at each of the angles—the latter inconspicuous because placed on the red lateral margin; they are small and of equal sizes. The spots on the elytra are of about the same size as those on the pronotum and very equal in size *inter se*; there are about 5 spots on the lateral margin and from 3 to 5 on each of the inner three interstices. Disregarding colour and markings the species differs from *decorata*, Er., by *inter alia* the very much less strongly rounded sides of its prothorax, and from *lacera*, Pasc., by *inter alia* the sides of its prothorax considerably less rounded and without the slightest sinuosity of outline. It has no fascicles on its surface. An abraded specimen of this insect agrees so remarkably well with Pascoe's description of *Peltis moniliata* that I can hardly doubt its being specifically identical. It is decidedly a *Leperina*; if there should be found an insect (distinct from this) which is Poscoe's *moniliata* the latter will no doubt be found to be not a *Leperina*, and in that case no harm will be done by the repetition of the name.

Victoria (Dividing Range) and Tasmania.

PELTONYXA.

P. invalida, sp. nov. Elongata; postice leviter dilatata; minus convexa; vix pubescens; testaceo-ferruginea; capite prothoraceque rufescentibus, alutaceis et sparsissime obsoletissime puncturis impressis; prothorace quam longiori circiter duplo latiori, antice parum angustato, lateribus leviter arcuatis minus late reflexis, angulis posticis rotundatis; elytris minus fortiter seriatim punctulatis, interstitiis nonnullis latera versus obsolete prominulis. Long., 1⅔ l.; lat., ⅔ l.

Near *P. australis*, Blackb., but easily distinguishable from it by *inter alia* the less straight sides of its prothorax, and the considerably smaller and much less deeply impressed punctures of its elytra. Some of the interstices of the elytra near the lateral margin are very slightly raised (in *australis* the alternate interstices throughout are so) but so slightly that their elevation is only to be seen from some points of view. *P. pubescens*, Blackb., differs from both the above *inter alia* by its very much more plentiful pubescence; and *P. Deyrollei*, Reitter, by its considerably greater size, also by the alternate interstices of its elytra being elevated, a character that could not be attributed even to *P. australis* without the qualifying word "scarcely" before "elevated," also by its elytra being striate.

N.S. Wales (Blue Mountains).

COLYDIIDÆ.

DITOMA.

A large number of species have been attributed to this genus which have since had to be removed from it and formed into distinct genera. The number of these is so great that without access to a large collection of the *Colydiidæ* of the world it is impossible to deal satisfactorily with the generic apportionment of the Australian species at present standing under the name *Ditoma*. According to Lacordaire the essential characters of *Ditoma* in the "Tribe" *Synchitides* are as follows "Basal 3 joints of tarsi equal or nearly so *inter se*, tibiæ not spinous externally but armed with a small apical spine, all the tarsi four-jointed, mandibles bidentate at apex, the ventral segments all emarginate behind, head devoid of antennal sulci, club of antennæ two-jointed, sides of prothorax narrowly margined. Of the characters above mentioned that based on the form of the hindmargin of the ventral segments does not appear to me to be founded on correct observation. I have before me specimens of the European *D. crenata*, Hbst. (the type of the genus) and cannot find that its ventral segments are emarginate behind, or differ noticeably in outline from their form in allied genera. Nor do I find that authors subsequent to Lacordaire make any use of this character. In spite, therefore, of the great weight of Lacordaire's authority I think this character must be dropped. Applying the other characters assigned by Lacordaire strictly I cannot find any described Australian *Colydiid* which is a true *Ditoma* In the absence, however, of assurance that I have before me the diagnoses of all the described genera closely allied to *Ditoma* I do not feel justified in proposing new generic names for those which do not fall into any already named genus known to me, and therefore must leave them provisionally in *Ditoma*. As I have before me authentic specimens (in every case but one, the type) of all the Australian species except one that have been described as *Ditoma* I may perhaps advantageously furnish some notes on them:

D. serricollis, Pasc., is the only species of which I have not an authentic example. Its author does not enumerate its structural characters in detail but says that "as far as external characters go" it is certainly a *Ditoma*. So many genera near *Ditoma* have been established since the date (1860) of that note that it cannot now be taken for more than a statement that the insect is a *Ditoma* rather than a member of any other then known genus. It appears to me to be probably identical with *lineatocollis*, Blackb., which some years ago M. Grouvelle (a specialist on the *Colydiidæ*) informed me that he considered I had done right in acing in *Ditoma*. Its description is not sufficiently detailed to

allow of its confident identification without examination of the type but the description (so far as it goes) and locality suggest *lineatocollis*. If so, I doubt whether it can stand permanently in *Ditoma* on account of the very decidedly expanded and denticulate lateral margins of its pronotum the extreme edge of which is not bounded (as it is in *Ditoma crenata*) by a raised edging. I do not however know of any other described genus in which it can be placed.

D. lineatocollis, Blackb. It is not improbable that this name will have to sink as a synonym of *serricollis*, Pasc. (discussed above).

D. costata, Macl., and *torrida*, Blackb. These must be transferred to the genus *Phormesa*.

D. pulchra, Blackb., *obscura*, Blackb., and *nivicola*, Blackb., appear to be congeneric with the New Zealand species *D. sellata*, Shp., attributed by its author doubtfully to *Ditoma*. Dr. Sharp, however, thought it might be congeneric with species for which Broun had, without giving a diagnosis of the generic characters, proposed the name *Ablabus*. I have examined the descriptions of the species in question and think Dr. Sharp's conjecture probably correct, and am disposed to refer my three species named above to *Ablabus*. They differ from *Ditoma* in having the lateral margins of their head and pronotum strongly expanded and indented, by the presence of antennal sulci, and by their much more strongly granulate eyes. They are very near *Sparactus*, but the sides of their head and pronotum are much more strongly dilated and indented, and the club of their antennæ has only two joints. From *Phormesa* they differ by the indented margins of their head and pronotum, their noncarinate elytra, the longer sulci for the reception of their antennæ, and their much smaller eyes. M. Grouvelle has suggested doubtfully *Endophlœus* for them, but the apex of their tibiæ undoubtedly has a small spine, which is inconsistent with *Endophlœus*.

D. perforata, Blackb. This species cannot stand permanently in *Ditoma*, owing *inter alia* to the form of the antennal club, the first joint of which is very much larger than the other—the latter being little more than rudimentary. M. Grouvelle has suggested to me that the insect might be placed in *Synchita*, which also has the apical joint of its antennæ rudimentary. (According to Lacordaire the 11th joint is altogether wanting, but to me it seems in *S. juglandis*, Fab.—the type of the genus I believe — to be distinctly visible, though very small). *D. perforata* would, I think, be as aberrant in *Synchita* as in *Ditoma*, owing to the sides of its prothorax being strongly dentate and its eyes more coarsely granulate and much more

prominent. It differs much also in facies from *Synchita* (at least from *S. juglandis*) being much narrower and more elongate, with longer and more slender antennæ, the club of which is notably smaller and especially less globular.*

D. hilaris, Blackb., though very different from *lineatocollis*, Blackb. (vide supra) as a species, does not seem to differ from it in respect of any character likely to be generic.

D. parva, Blackb. This species cannot stand in *Ditoma*, nor can it be placed in any other hitherto described genus known to me. It differs from *Ditoma* by the eleventh joint of its antennæ, much narrower (and a little shorter) than the tenth, by the presence of well defined antennal sulci which are so long as to curve outward behind the eyes, by the head furnished with lobe-like processes behind the eyes which project laterally beyond the outline of the eyes, and by its pronotum having a comparatively wide and distinctly serrate flattened lateral border.

SPARACTUS.

I believe this genus to be identical with *Illestus*. Its type is *Ditoma interrupta*, Er., the correctness of my identification with which of a small *Colydiid* (common in Tasmania and Southern Australia) is not, I think, open to the slightest uncertainty. In the subsequent diagnosis of the genus *Sparactus* (formed for this insect), the tibiæ are not mentioned, but in Erichson's tabulation of *Colydiid* genera the place given is among those having unarmed tibiæ. This is a mistake as its tibiæ have a very short apical spine,—which however might very easily be overlooked as from most points of view it is hidden. In all other respects the *Colydiid* mentioned above agrees perfectly with the generic diagnosis and with the description of the species. It also agrees with the diagnosis of *Illestus*, with Pascoe's figure of *Illestus* (Journ. Ent. II., pl. iii., fig. 4), and with Reitter's description of *Illestus Grouvellei* (M. T. Münch. Ent. Ver. 1877, p. 133). The only apparent discrepancy in the descriptions of *D. interrupta* and *I. Grouvellei* is in the statement that the inner elytral costa of *D. interrupta* is interrupted whereas in his description of *Grouvellei* Reitter implies that the second costa only is interrupted. In a subsequent note, however, Grouvelle speaks of only the second costa being "distinctly several times" (deutlich mehrmals) interrupted. In the specimens before me neither costa is quite entire (as the external one is) but the middle one is much more distinctly interrupted than the inner one.

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* Since writing the note on *D. perforata* I have ascertained that the Malayan genus *Bupala*, Pasc., presents the characters I have specified as exhibited by that insect, to which genus, therefore, I think I may safely attribute it.

S. costatus, Blackb. I believe this species to be identical with *Illestus productus*, Reitt., which will therefore stand as follows

Sparactus (Illestus) productus, Reitt.
S. costatus, Blackb.

PHORMESA.

P. (*Ditoma*) *torrida*, Blackb. This species is not a true *Ditoma* (vide supra).

P. thoracica, sp. nov. Minus depressa; sat opaca; ferruginea, capite pronoti disco et elytrorum maculis numerosis (his fascias 4 indeterminatas formantibus) obscure fuscis; prothorace sat fortiter transverso, postice quam antice fere duplo latiori, supra crebre fortius granulato-ruguloso, utrinque bicostato, costis exterioribus integris (interioribus prope marginem anticum introrsum subito versis et hic inter se fere conjunctis, postice introrsum sic ut laquea singula formant versis), lateribus irregulariter crenulatis sat arcuatis, angulis anticis fortiter productis sat acutis posticis retrorsum inclinatis anguste obtusis; elytris singulis 5-carinatis, interstitiis crasse biseriatim punctulatis. Long., $2\frac{2}{3}$—$2\frac{4}{5}$ l.; lat., $\frac{9}{10}$—$1\frac{13}{10}$ l.

In general appearance much like *P. torrida*, Blackb., from which it differs chiefly by the costæ of its pronotum and elytra less sharply defined, its prothorax very much more strongly narrowed in front and the hind angles of that segment obtuse (they are very sharply acute in *torrida*). Several species of *Phormesa* more or less resembling this one have been described from the Malay Archipelago, &c., but the descriptions of them are too slight to allow of confident identification,—not one of those known to me referring (e.g.) to the angles of the prothorax.

Tropical Australia (Port Darwin).

P. Grouvellei, sp. nov. Sat depressa; sat opaca; picea, capite antice prothoracis lateribus antennis pedibusque ferrugineis; prothorace sat fortiter transverso, antrorsum leviter angustato, supra confertim minus fortiter punctulato-ruguloso, utrinque bicostato, costis ut præcedentis (*P. thoracicæ*), lateribus leviter sparsim crenulatis fere rectis, angulis anticis modice productis sat acutis posticis acute rectis vix retrorsum inclinatis; elytris singulis 5-carinatis, interstitiis biseriatim granulatis. Long., $1\frac{3}{4}$ l.; lat., $\frac{7}{10}$ l.

Differs from the previously described Australian species of *Phormesa* by the uniform colour of its elytra and by the sculpture of the intervals between the elytral costæ consisting of rows of small granules. Its prothorax is very much less narrowed in front than is that of *P. thoracica*, and very much more

strongly transverse than that of *P. costata*, Macl. The sides of its prothorax are quite straight in the hinder part while in *P. torrida* they are quite strongly convergent hindward in the extreme basal portion of their length.

Australia (I am not sure of the exact habitat).

BUPALA.

Pascoe calls the antennæ of this genus ten-jointed, representing them as in this respect similar to those of *Synchita*. The species that I refer to this genus have antennæ similar in number of joints to those of *Synchita*, but I cannot call the antennæ of either ten-jointed without qualifying the expression by saying that the 11th joint is distinctly visible under a strong lens. Lacordaire qualifies the expression by the remark (in referring to *Synchita*) that the tenth joint has a small pubescent apical portion, which is, I think, undoubtedly the rudimentary eleventh joint. In the specimens before me it is a trifle more distinct than in *Synchita*. In Pascoe's figure of *Bupala* it is not represented, but I cannot think it is really absent in the insect. Pascoe defines the genus very briefly, and passes over the important character of the lateral structure of the prothorax with the remark—"prothorax haud marginatus." His figure, however, represents the prothorax as serrate laterally (which it is in the specimens before me). I suppose the "haud marginatus" refers to the absence of a reflexed edging. The Australian insects that I attribute to this genus present the character mentioned by Pascoe of hind coxæ somewhat widely separated *inter se*, but with the intercoxal process of triangular form. I may add that M. Grouvelle some years ago expressed the opinion that my *Ditoma perforata* would be better placed in *Synchita*. If, however, *Bupala* be accepted as distinct from *Synchita* these Australian forms belong to it rather than to the old genus. It is to be noted that the tenth joint of their antennæ is less globular than it is represented in Pascoe's figure, but this no doubt is a mere specific character.

B. Bovilli, sp. nov. Elongata; sat angusta; minus nitida; nigro-picea, capite antice prothorace antice elytrorum humeris corpore subtus antennis pedibusque plus minusve rufescentibus; capite pronotoque crebre sat crasse granulato-rugulosis; hoc quam latiori sublongiori, retrorsum nonnihil angustato, supra æquali, lateribus sat rectis dentibus parvis acutis circiter 10 armatis, elytris striatis, interstitiis sat planis sat crasse rugulosis seriatim albido-setulosis. Long., 1½ l.; lat., $\frac{3}{10}$ l.

There seems to be no reason for separating this species generically from the S Australian species that I described as

Ditoma perforata. In both the upper surface is devoid of costæ and other protuberances, the eleventh joint of the antennæ rudimentary, the sides of the prothorax denticulate, the head without antennal sulci. It differs from *perforata* by its considerably smaller size, its more cylindric form (elytra scarcely wider than prothorax), the rugulosity of its elytra interstices, &c.

Northern Territory (Port Darwin); taken by Dr. Bovill.

B. dentata, sp. nov. Sat elongata; sat angusta; minus nitida; nigro-picea, antennis pedibus scutello et corpore subtus rufescentibus; capite pronotoque crebre minus grosse granulato-punctulatis; hoc leviter transverso, ante medium subito dilatato, antice quam ad basin multo latiori, supra æquali, lateribus acute serrulatis; elytris striatis, striis sat grosse punctulatis (puncturis in interstitiis fere confluentibus). Long., $1\frac{1}{4}$ l.; lat., $\frac{3}{4}$ l.

At once distingishable from *B. perforata*, Blackb., and *Bovilli*, Blackb., by the somewhat sudden widening of its prothorax in front of the middle, which causes the front margin to be very much wider than the base In this species the lateral margin of the head is minutely angular behind the eye, standing out (under a strong lens) as a very small tooth, and more conspicuous on the under surface.

S. Australia (near Adelaide).

EBA.

E. cerylonoides, Pasc.? An example from Port Darwin seems to agree very well with the diagnosis of this Malayan genus, nor can I find any notable distinctive character to suggest its being other than the typical species, which was described Journ. Ent. II, p. 129. It is an interesting addition to the Australian fauna. It bears much casual resemblance to the genus *Cerylon*.

MERYX.

I cannot satisfy myself that *M. rugosa*, Latr., *areolata*, Pasc., and *illota*, Pasc., are anything but one and the same species. The only definite character that Pascoe cites to distinguish his two species relates to the length and width of the prothorax. I believe the difference in the shape of the prothorax to be sexual; at any rate I have before me two examples of *M. æqualis*, Blackb., which were taken in company and which differ *inter se* fully as much in the comparative width of their prothorax as any two examples before me of the older species (which come from various localities in Victoria and Tasmania). This difference is certainly very considerable and might justifiably be regarded as specific if only a few specimens were available.

Latraille's description of *M. rugosa* is very short but Pascoe says that he has seen an example of it and considers it probably identical with his *illota* (Journ. Ent. I., p. 302).

TENEBRIONIDÆ.

CHALCOPTERUS.

C. Arthuri, sp. nov. Elongato-ovalis; sat nitidus, pronoto magis opaco; niger, elytris violaceo-aureo-vel viridi-iridescentibus; capite minus crebre punctulato, fronte media longitudinaliter lævi, oculorum interspatio antennarum articuli basalis longitudini latitudine sat æquali; sulcis ocularibus nullis; antennis quam corporis dimidium vix brevioribus; prothorace quam longiori fere duplo (postice quam antice ut 4 ad 3) latiori, leviter sat crebre (quam caput multo magis obsolete) punctulato, antice subsinuatim fortiter emarginato, a basi antrorsum (superne viso) subarcuatim angustato, basi obsolete sinuata, angulis anticis acutis sat productis posticis fere rectis; elytris haud striatis, fortiter minus crebre (fere ut *C. variabilis*, Blessig., ut a me definitus, vide P.L.S., N.S.W., 1893, p. 58) seriatim punctulatis, interstitiis crebre sat fortiter (quam *C. variabilis* multo magis fortiter) punctulatis; prosterno medio leviter obtuse carinato; tarsis nigrosetosis, posticorum articulo basali quam ceteri conjuncti vix breviori. Long, 5 l.; lat., $2\frac{2}{3}$ l.

In my tabulation of the genus *Chalcopterus* this species falls beside *C. intermedius*, Blackb. (P.L.S., N.S.W., 1893, p. 61), from which it differs *inter alia multa* by the very much larger seriate punctures of its elytra.

Queensland; from Mr. Lea (Brisbane), &c.

LONGICORNES.

SYMPHYLETES.

S. compos, sp. nov. Modice elongatus; piceus, pube pallide grisea sat æqualiter (areis nonnullis glabris exceptis) vestitus, supra hanc basin griseam notulis numerosis fulvopubescentibus et nonnullis niveo-pubescentibus superpositis (illis in facie maculatim, inter antennas lineatim, in prothorace transversim 4-lineatim, in elytris maculatim, in metasterno maculatim, in abdomine transversim lineatim, in pedibus maculatim et in tarsis subtus dispositis; his in prothoracis lateribus, in elytrorum lateribus circum humeri partem inferiorem et paullo pone mediam partem, in metasterni episternis, in femorum parte superiori, et in antennarum articulorum 2^i—10^i parte basali, sitis); capite haud convexo-elevato, linea longitudinali impresso, clypeo antice angustato et rotundato; oculis modicis, ut *S. nodosi*, Newm.,

granulatis et convexis sed paullo majoribus; antennis elytrorum apicem (maris paullo, feminæ vix) superantibus, subtus densissime longius ciliatis; prothorace brevi transverso cylindrico haud tuberculato; elytris in parte antica granulis nonnullis parvis instructis (his minus perspicuis), ad apicem sat recte truncatis.

Maris segmento ventrali 2° utrinque area dense brunneo-pilosa instructo; hujus margine interiori a segmenti margine anteriori medio ad segmenti marginem posteriorem curvato et hunc (prope marginem lateralem) vix attingenti. Long., $5\frac{3}{4}$—$6\frac{1}{2}$ l; lat., 2—$2\frac{1}{3}$ l.

In the above description I have not specified the position of the glabrous areas on the upper surface because it is impossible to say whether the two examples before me are absolutely free from artificial abrasion, although both have the appearance of being in very fresh condition. A large round humeral area is certainly naturally glabrous, and I suspect it alone is so, the other small glabrous patches being probably due to slight abrasion. The species is near *S. albocinctus*, Guér., from which it differs *inter alia* in not having a continuous white stripe (but only the edging of the external half of the glabrous humeral patch and a spot behind the middle) along the external margin of its elytra. From a *Symphyletes* which Mr. Gahan confirms me in regarding as *albocinctus* it also differs by its very much shorter and more strongly transverse prothorax, by its head being scarcely concave between the antennæ, &c. In the male example before me the anterior femora do not bear a spine.

N. Queensland (Hughenden); given to me by Mr. French.

RHYTIPHORA.

R. maculosella, sp. nov. Fem. Elongata; minus robusta; nigro-picea pube fulva et nivea ornata (hac maculas binas in elytrorum lateribus, illa in capite maculas numerosas parvas et lineas inter antennas circumque oculos in prothorace lineas transversas quatuor in elytris maculas numerosas parvas, formanti), mesosterno utrinque vitta fulva ornato, metasterno ad latera niveo-pubescenti in medio fulvo-maculato, abdomine cinereo et fulvo-variegato, femoribus anticis 4 cinereo-pubescentibus posticis fulvo-variegatis, tibiis obscure fulvo-ornatis; capite sparsim subtilius punctulato, supra sat fortiter elevato-convexo, linea longitudinali impresso, clypeo antice truncato; oculis modicis vix fortiter granulatis (quam *R. latifasciatæ*, Pasc., paullo minoribus paullo minus fortiter granulatis), lobo inferiori haud latiori quam longiori; antennis quam corpus vix longioribus, pube cinerea irregulariter variegatis, subtus pilis sat elongatis

dense fimbriatis, articulo 3° quam 1ᵐ sesqui longiori; prothorace cylindrico, quam longiori vix latiori, ut caput punctulato, nec supra nec ad latera tuberculato; elytris ad apicem truncatis, antice granulis sat numerosis inordinatim instructis, postice puncturis (his prope medium sat grossis hinc retrorsum gradatim magis subtilibus) impressis.

This species is in general so like *Symphyletes albocinctus*, Guér., that it seems unsatisfactory not to place it near that insect, but it has the head strongly elevated above the base of the antennæ,—a character which Pascoe regarded as the essential one separating *Rhytiphora* from *Symphyletes* and which is the only character known to me by which they can be separated. The portions of the upper surface not bearing fulvous or white spots are glabrous and shining. The snowy-white pubescence of the elytra forms a spot on the lateral margin (behind the glabrous shoulder) which is continuous with similar pubescence on the side of the metasternum; it also forms a spot on the lateral margin a little behind the middle. Between the two white spots are two or three spots of fulvous pubescence which are variably more or less connected with each other. The disposition of the fulvous markings on other parts of the elytra and on the head and pronotum is much the same as in *S. albocinctus*.

Queensland.

R. uniformis, Blackb. I have before me two specimens from N. Queensland (sent by Mr. French) which I cannot distinguish from the type of *uniformis* except in their somewhat different colouring,—due I have no doubt to their being very fresh specimens. They bear sprinkled over the pale ashy pubescence of the upper surface (which suggested the specific name) numerous blotches of pale orange-coloured pubescence. This forms longitudinal lines between the antennæ, transverse lines on the pronotum, small spots of irregular shape all over the elytra, spots on the sterna and legs and fringes on the hindmargin of the ventral segments. The glabrous spaces on the type (mentioned as probably due to abrasion) are present in these fresh examples, and therefore are no doubt natural.

ABSTRACT OF PROCEEDINGS

OF THE

Royal Society of South Australia,

FOR 1901-2.

ORDINARY MEETING, NOVEMBER 5, 1901.

WALTER HOWCHIN, F.G.S. (Vice-President) in the chair.

The President apologised for non-attendance.

BALLOT.—Isaac Herbert Boas, B.Sc., and H. Gill Williams, L.D.S., as Fellows.

W H. SELWAY, referring to the late Professor Ralph Tate's natural history collections, asked if anything had been done that these might be preserved to the State. The CHAIRMAN said that so far nothing had been done, but that he was now in a position to deal with the matter.

EXHIBITS.—STIRLING SMEATON, B.A., a piece of sandstone, showing leaf impression, apparently Eucalyptus, from Island Lake, on the route to Tarcoola, and opal specimen from L. Hart. These were lent by J. W. Jones, Conservator of Water, for exhibition. WALTER HOWCHIN, F.G.S., showed specimens of Cambrian glacial clay and striated stones found in the Pekina Ranges, west of Orroroo, by Chas. F. Johncock, of Willowie. These are very characteristic of the formation as it occurs in other places.

W. H. SELWAY exhibited specimens of rare orchids, *Pterostylis cucullata* from the National Park, and *P. rufa* from the Gorge.

PAPERS.—"Descriptions of New Species of Corals from the Australian Tertiaries," Part iv., by JOHN DENNANT, F.G.S. "Notes on the Loranthaceæ of the Willochra Valley," by CHAS. F. JOHNCOCK. "Geological Section of the Mount Lofty Range," by C. L, WAINWRIGHT. "On Eucalyptus Behriana," by J. H. MAIDEN, F.L.S., Government Botanist, N.S.W.

ORDINARY MEETING, APRIL 8, 1902.

Professor E. H. RENNIE, D.Sc. (President) in the chair.

EXHIBITS.—WALTER HOWCHIN, F.G.S., brought under the

notice of the meeting an obsidianite exhibited by A. Ferguson, from Western Australia, some distance north of Coolgardie. Mr. Howchin observed that these stones, at one time thought to be of volcanic origin, are now more generally considered to be meteoric. They are found in many parts of Australia where no volcanic action has yet been discovered. Mr. HOWCHIN also showed specimens of calcium phosphate recently discovered on Yarroo Station, Yorke Peninsula. It is found between reefs of Cambrian limestone in what appear to be waterworn hollows, and occurs in lenticular masses among triturated shale. Fossil trilobites of Cambrian age are found beneath the phosphates. Mr. HOWCHIN mentioned that he had traced the Cambrian rocks which underlie the phosphatic beds almost uninterruptedly from Ardrossan to Kulpara. EDWIN ASHBY exhibited specimens of bird skins from Western Australia (*Cliniacteris superciliosus*) (*Cracticus nigrigularis*), the black-throated butcher bird being the first specimen from Western Australia; *Pterodocys phasianella*, ground forked-tail graculus; *Petrœca rosea*, rose-breasted Robin found in the ranges of Victoria; *Acanthiza reguloides*, two specimens showing the light typical form of New South Wales and the dark form of this State, and several others of same genus. STIRLING SMEATON, B.A., showed specimens of brown coal from Lake Phillipson bore of much the same character as that from Leigh's Creek. Mr. SMEATON drew attention to the peculiar interest of this discovery as probably indicating the south and west limits of the artesian basin, and as showing the probable existence of old lake beds in this neighborhood. Mr. SMEATON, as one of the delegates to the Australasian Association for the Advancement of Science meeting at Hobart in January, 1902, reported that the next meeting of the Association would be at Dunedin, New Zealand, in 1904. He also mentioned that the time of year for the meeting in Adelaide in 1906 had not been determined. J. G. O. TEPPER, F.L.S., exhibited specimens of two grain beetles, *Calandra granariæ* and *Silvanus surinamensis*, and a bottle of grain which these insects had completely destroyed. Mr. TEPPER also mentioned that a parasitic wasp of the family *Proctotrypidæ*, about $\frac{1}{16}$ inch long, was found associated with the beetles in the bottle of grain.

PAPERS.—"The Cretaceous Fossils of South Australia and the Northern Territory," by ROBT. ETHERIDGE, Curator of the Australian Museum, Sydney. W. HOWCHIN, F.G.S., in introducing the paper, mentioned that it would be printed in quarto similar to the Callabonna Memoirs. A vote of thanks to the author, Mr. Etheridge, was passed. "Further Descriptions

of the Australian Coleoptera," by Rev. THOS. BLACKBURN, B.A. A vote of thanks to Mr. Blackburn for his paper was passed. J. G. O. TEPPER read a short paper on a curious instance of luminosity in Ants (*Iridomyrmex*) observed by Mr. A. A. STYLES, of the Public Library.

ORDINARY MEETING, MAY 6, 1902.

Professor E. H. RENNIE, D.Sc. (President), in the chair.

BALLOT.—Walter George Woolnough, B.Sc., F.G.S., as a Fellow.

EXHIBITS.—HERBERT BASEDOW exhibited the following shells in illustration of his paper: *Anapa cuneata* (Lam.). *Tellina deltoidalis* (Lam.), *Chione lævigata* (Sby.), *Risella melanostoma* (Gmelin), *Hemimactra ovalina* (Lam.), *Mactra polita* (Chem). A. C. ZIETZ, F.L.S., exhibited a number of Bower birds—the satin Bower bird (*Ptilonorhynchus violaceus*), in its satin blue coat, with a hen and young male bird, each greyish-green in color. A spotted Bower bird (*Chlamydodera maculata*), with bright lilac feathers on neck. A tooth-billed Bower bird (*Scenopœus dentirostris*), and Regent bird (*Sericulus melinus*). E. ASHBY exhibited three specimens of the sub-family *Himantopodinæ*—a white-headed Stilt (*Himantopus leucocephalus*), a young banded Stilt (*Cladorhynchus leucocephalus*), the chestnut band not showing, and a red-necked Avocet (*Recurvirostra novæhollandiæ*).

PAPERS.—"A Brief Note on the Occurrence of a Raised Beach on Hindmarsh Island, South Australia," by HERBERT BASEDOW. The position of the beach the subject of this paper is situated on the main track on Hindmarsh Island, about five miles from the Goolwa Ferry, near the mill, and consists of an imbedded, softish, calcareous sandstone capped by a thin layer of travertine and loose black soil, and is practically level. The sandstone, though extremely rich in molluscan remains in good preservation, yet lacks much variety of species. The most abundant are those laid on the table and mentioned above, and are species now inhabiting the neighboring seas. In places the sandstone gives way to a barren, rather fine-grained, sandrock, weathering conspicuously along the borders of the Island into shallow caves, with stalactitic protuberances hanging from their roofs, produced by the water carrying and depositing carbonate of lime round the roots of the present vegetation, which obviously form ready watercourses. This lime hardening round the roots forms a cement that resists the disintegrating action of the atmosphere better than the surrounding rock, and thus the

pendant masses are produced. The consolidation of this crust of calcium carbonate may ultimately kill the roots that they enclose. In many cases complete molecular substitution has taken place between the organic portions of the root and the calcium carbonate, whilst retaining the organic structure. The occurrence of a raised beach on Hindmarsh Island is another proof of the retreat of the sea in recent times, either by the gradual rising of the land as a whole, or, what seems the more likely, by the formation of marginal lakes now so common a feature on our south-east shores. The sandrock mentioned above is water-bearing at depths of six feet and upwards, the supply apparently being drawn directly from the River Murray. Mr. W. HOWCHIN, F.G.S., mentioned that raised beaches are found at various points near the coast from Eucla to the Coorong. Salt Creek, which flows into the Coorong, has cut its way through a thick mass of seashells, forming cliffs six or eight feet high of shell matter. Mr. HOWCHIN also stated that stalactitic action is common to most raised beaches, and may be seen at the Reedbeds, Brighton, Port Victor, and other places. He also stated that the elevation of the land near Adelaide is about 12 ft., whilst it has risen as much as 80 ft. in the South-East. Mr. SAM. DIXON stated that raised beaches are to be found along the south coast in the neighborhood of Esperance Bay and as far as Mount Barren. Mr. EDWIN ASHBY, referring to the shells shown by Mr. Basedow, pointed out that they were estuarine in character, but that on Hindmarsh Island, opposite Goolwa, a true marine shell is found, namely *Donax epidermia*. This mollusc is found on Middleton beach, and is known as a cockle.

PAPER.—"Further Notes on the Botany of the Willochra Valley," by CHAS. F. JOHNCOCK.

A vote of thanks was passed to those exhibiting specimens and to Mr. Johncock for his interesting paper.

ORDINARY MEETING, JUNE 3, 1902.

WALTER HOWCHIN, F.G.S. (Vice-President) in the chair.

BALLOT.—R. H. LaB. Cummins, of St. Peter's College, as a Fellow.

PAPER.—"Descriptions of New Species of Fossil Mollusca from Miocene Limestones near Edithburg, South Australia," by HERBERT BASEDOW. Mr. Basedow mentioned that the specimens described in his paper had been referred by him to the late Professor Tate for description, but owing to his

illness and death this had not been done. "A Revision of Australian Hesperiadæ," by EDWARD MEYRICK, B.A., F.Z.S., and OSWALD LOWER, F.E.S., Lond. This paper was introduced by Mr. J. G. O. TEPPER, F.L.S., who exhibited some specimens of this family of butterflies, which are commonly known as "Skippers," because of their short, jerky flight. A. H. C. ZIETZ, F.L.S., exhibited eggs of the Northern Territory Bower bird, very rare, and of the Ewings Fruit Pigeon. He also exhibited the skin of a large Rufus Owl, probably a New Guinea species, and a skin of the Rainbow Pitta, and a very uncommon egg, that of the Drongo Shrike. Mr. R. FLEMING exhibited a fine specimen of fresh water sponge, which Mr. Zietz stated was a species of Spongilla. Mr. Zietz exhibited a very interesting collection of bird skins and eggs collected by Mr. C. E. May in the neighborhood of Port Darwin, and presented by him to the Museum. Mr. J. G. O. TEPPER, F.L.S., exhibited a piece of limestone from Mannahill forwarded by Mounted-Constable Waterhouse, of Crystal Brook, who supposed the markings on it to have been done by aborigines. Mr. TEPPER explained that these were due to the action of certain algæ and lichens. The Secretary was instructed to write to Mr. Waterhouse and ask him to protect any native etchings he might any time know of from being disfigured. WALTER HOWCHIN, F.G.S., through the kindness of Mr. Zietz, Assistant Director of the Museum, exhibited some of the bone breccias from The Brothers Islands, Coffins Bay. Mr. HOWCHIN described the conditions under which the deposits were probably formed, and mentioned that the determination of the fossil bones was not complete, but bones of large extinct kangaroos and emus, together with the cranium of a seal, the jaws of a wallaby, and bones of small marsupials, indeterminable, were known to occur. At the time of the deposition of these bones The Brothers Islands must have formed part of the mainland. Mr. HOWCHIN also showed a lump of limestone from Port Lincoln forwarded by Mr. E. R. Bartlett, containing a bone determined by Professor Stirling to be the femur of a wombat. The matrix consisted of two classes of rock, the lower a granular foraminiferal limestone of uncertain age, and the other an upper crust of superficial travertine, in which the sub-fossil, with other smaller bones, was contained. Mr. SAM. DIXON's notice of motion of incorporation of this Society was read by the acting secretary, Mr. EDWIN ASHBY.

A vote of thanks was passed to those exhibiting specimens and giving papers.

ORDINARY MEETING, JULY 1, 1902.

Professor E. H. RENNIE, D.Sc. (President) in the chair.

BALLOT.—A. G. Edquist and James Drinkwater Iliffe, B.Sc., were elected Fellows.

NOMINATION.—G. Jeffreys as a Fellow.

EXHIBITS.—W. HOWCHIN, F.G.S., exhibited a sample of rock containing characteristic Miocene fossils obtained from the sinking of a well at Messrs. Sandford & Co.'s, Grenfell-street, at a depth of about 60 ft. Mr. HOWCHIN stated that the same rock was met with in the well of the new Exchange Buildings. These occurring south of the outcrop at Government House Quarry are of some interest. A. H. C. ZIETZ, F.L.S., exhibited a young flounder, and remarked that whilst very young this fish is almost symmetrical, and swims with only a little inclination sideways, but gradually the twist in mouth, eyes, and body takes place as it becomes older. STIRLING SMEATON, M.A., exhibited a Kangaroo Mouse (*Antechinus*) from the South-East, and galls of Casuarina (*Frenchia casuarinæ*). J. G. O. TEPPER, F.L.S., laid a specimen of vanadium ore on the table, and exhibited a scale (*Cylindrococcus casuarinæ*).

The consideration of the notice of motion of incorporation of this Society was adjourned until next meeting.

ORDINARY MEETING, AUGUST 5, 1902.

Professor E. H. RENNIE, D.Sc. (President) in the chair.

BALLOT.—G. Jeffreys, Lecturer on Woolsorting, School of Mines, as a Fellow.

EXHIBITS.—J. G. O. TEPPER, F.L.S., a stem or root of curious growth; also a vine shoot attacked by scale (*Lecanium depressum* ?), which retained its green color although withering away. Mr. TEPPER also exhibited a rare moth from Queensland, which had been presented to the Museum by Mr. Oswald Lower. A. H. C. ZIETZ, F.L.S., a partly dried specimen of Flying Fox (*Pteropus*), found about 100 miles east of Leigh's Creek. EDWIN ASHBY, a skin of Goshawk (*Astur approximans*), and mentioned that the brown markings are across the body in adult birds, but longitudinal on that of the young. Mr. ASHBY also exhibited a skin of the Whistling Eagle (*Haliaëtus sphenurus*) from Blackwood, and the head of an Ibis. W. HOWCHIN, F.G.S., some gastroliths from the River Murray, presented to him by Mr. Gill, the Under-Treasurer.

Mr. SAMUEL DIXON then proposed—(*a*) "That in the opinion

of this Society the time has come when it is desirable that funds should be provided with the object of assisting, co-operating with, and rewarding research in applied science or natural history which have a direct bearing upon the economic development of the State and the production of wealth from its natural resources, and also for encouraging research amongst all classes of the community. (*b*) That in furtherance thereof this Society be incorporated. (*c*) That an appeal be made to the public for funds to carry out the object aimed at. (*d*) That the Council be a committee, with power to add to their number, to formulate a scheme to attain the objects stated in clause *a*. Mr. DIXON said it was incumbent on the Fellows of the Royal Society to do their utmost to promote science and to place their institution on a stronger and sounder basis. They should cultivate lines of study which the large number of students at present coming forward from the University might be likely to take up. The Society should be provided with funds that would enable it to aid those who were pursuing promising investigations, but could not well afford the cost entailed in their experiments, and ought also to have an amount invested sufficient to yield interest for the purchase of medals to reward and encourage research. Every effort should be made to encourage the development of the brains of the community in other directions than that of money-getting. With the funds mentioned they would, of course, require a scheme for their proper management and allotment. He had no fear, although the Government were going in for retrenchment largely, that the grant from the State would be diminished, for it was generally recognised that only by the cultivation of the spirit of scientific research could communities prosper at the present day. Mr. ASHBY seconded, and the motion was carried unanimously. Mr. CHAS. F. JOHNCOCK wrote apologising for his absence, and expressing full approval of the motion for incorporation as it stands on the notice paper.

A letter was read from the Secretary of the Linnean Society of New South Wales calling the attention of the Society to the fact that the Queensland Government intended to retrench Mr. F. M. Bailey, the Government Botanist, which would prevent him finishing his work on "The Queensland Flora," and invited this Society to unite with other scientific bodies in petitioning the Premier of Queensland to allow Mr. Bailey to complete his work. The following resolution was then proposed by Mr. TEPPER, seconded by Mr. DIXON, and carried —"That this Society hears with sincere regret the intention

of the Queensland Government to retire Mr. Bailey from the position of State Botanist. It would respectfully urge that if this cannot be avoided, it may at least be delayed until the completion of Mr. Bailey's valuable work." The Secretary was instructed to forward the above resolution to the Premier of Queensland, and to inform the Secretary of the Linnean Society of New South Wales what had been done.

PAPER.—"Aboriginal Rock Painting on South Para," by Professor E. C. STIRLING, F.R.S.

ORDINARY MEETING, SEPTEMBER 2, 1902.

WALTER HOWCHIN, F.G.S. (Vice-President) in the chair.

The SECRETARY read a letter from the Chief Secretary's Office, Brisbane, Q., acknowledging receipt of letter of August 7, 1902, conveying motion passed by this Society urging that the services of Mr. F. M. Bailey, Colonial Botanist of Queensland, be retained until the completion of his work on the "Queensland Flora," to inform the Society that Mr. Bailey's services would be retained until the end of the present year to enable him to complete the work in question.

EXHIBITS.—Dr. MORGAN exhibited a number of bird skins from the Gawler Ranges. Amongst these were *Collyriocincla rufiventris*, *Micrœca assimilis*, *Smicroruis brevirostris*, *Malurus callainus*, *M. assimilis*, *Amytis textilis*, *Acanthiza tennuirostris*, *A. pyrrhopygia*, *A. uropygialis*, *Phyrrholaemus brunneus*, *Cinclosoma castaneonotum*, *Calamanthus campestris*, *Eopsaltria georgiana*, *Pachycephala gilberti*, *Climacteris superciliosa*, *C. rufa*, *Glycyphila albifrons*, *Ptilotis ornata*, *Pardalotus ornatus*. J. G. O. TEPPER, F.L.S., shoot of Canna, in which the scale (*Dactylopius*) had caused decay from top downwards. This scale, very active for this class of insect, is about one-eighth inch long, not very numerous, and conceals itself in the sheath of the plant, from which it is not easily removed. A. H. C. ZIETZ, F.L.S., a skin of flame-breasted Robin (*Petrœca phœnicea*). It is numerous in the Bassian sub-region, and is found near the foot of the Adelaide hills on newly ploughed land. Mr. ZIETZ also showed the skin of the fantailed Cuckoo (*Cacomantis flabelliformis*) and of double-banded Dottrel (*Aegialitis bicincta*). The former bird is found in the gullies near Adelaide, but seems to leave during the breeding season. The latter was shot near Balaklava, South Australia. Was in nuptial dress, but breeds in New Zealand.

PAPER.—"Some New Australian Geometrina, &c.," by OSWALD LOWER, F. Ent. S., London.

SPECIAL MEETING, OCTOBER 7, 1902.

Professor E. H. RENNIE, D.Sc. (President) in the chair.

The proposed rules* for the Royal Society of South Australia (Incorporated) having been read over, the following notice of motion was drawn out and signed: "We, the undersigned, Fellows of the Royal Society of South Australia, hereby give notice that the rules hereto attached be the rules of the Royal Society of South Australia (Incorporated).

(Signed) SAM. DIXON.
EDWIN ASHBY.
WALTER RUTT.
A. ZIETZ.
A. M. MORGAN.

[* For copy of Rules see page 345.]

ANNUAL MEETING, OCTOBER 21, 1902.

Professor E. H. RENNIE, D.Sc. (President) in the chair.

EXHIBITS.—W. H. Selway, a cephalopod in embryo stage.

The annual report and balance-sheet were read and adopted.

ELECTION OF COUNCIL.—President, Professor E. H. Rennie, D.Sc., &c.; Vice-Presidents, Rev. Thos. Blackburn, B.A., and Walter Howchin, F.G.S.; Hon. Treasurer, Walter Rutt, C.E.; Hon. Secretary, George G. Mayo, C.E.

MEMBERS OF COUNCIL.—W. L. Cleland, M.B., Professor E. C. Stirling, C.M.G., F.R.S., &c., Samuel Dixon, W. B. Poole, Edwin Ashby, W. H. Selway.

NEW RULES.—The rules of the Royal Society of South Australia (Incorporated) were read by the Secretary and passed, subject to correction of Rule No. 5 and alteration of Rule No. 42, in which two Auditors were substituted for one Auditor.

NOMINATION.—William John Vandenbergh, J.P., Solicitor and Barrister, as a Fellow.

PAPERS.—"Descriptions of New Corals of the Tertiaries of Australia (Part V.)," by JOHN DENNANT, F.G.S. "Further Notes on the Australian Coleoptera," by Rev. THOS. BLACKBURN, B.A. "List of Fish of the Lower Murray," by A. H. C. ZIETZ, F.L.S., C.M.Z.S., &c. "List of the Described Genera and Species of the Australian and Polynesian Phasmidæ with Introductory Remarks," by J. G. O. TEPPER, F.L.S.

PRESIDENT'S ADDRESS.—"Some Modern Developments of Chemistry." A vote of thanks to the President for his interesting and instructive address was passed.

Apologies were received from the Hon. Treasurer and Auditor, and a letter from Mr. F. M. Bailey, expressing his deep-felt thanks to the Society for the kind sympathy they had shown him in his scientific work.

ANNUAL REPORT.

OCTOBER 21, 1902.

The Council has to report that the leading feature of the year's work has been entomological, the principal contributors being the Rev. Thos. Blackburn, B.A.; Dr. Jefferis Turner, of Brisbane; Oswald Lower, F.E.S., Lond., of Broken Hill; and E. T. Meyrick, B.A,. now in England.

Vol. xxvi., Part I., of the Transactions was published in June last. Being a small number, it has only been issued to Fellows and members. When Part II. of this volume is ready for publication it will be bound up with Part I., and distributed to the various scientific bodies which receive the Transactions.

A valuable work on the "Cretaceous Fossils of South Australia and the Northern Territory," by Robt. Etheridge, of the Museum, Sydney, will shortly be published as one of the series of Memoirs.

The Malacological Section is now engaged in systematically revising the nomenclature of the South Australian mollusca belonging to the class *Pelecypoda*.

Two committees have been appointed—one to enquire into the whole question of the library and its arrangement; the other committee to examine and report upon the distribution of the Proceedings and Transactions.

With a view of extending the sphere of usefulness of the Society and increasing its value to the community, steps are being taken to form it into a corporate body and to establish a Research and Endowment Fund. By these means the Royal Society will be enabled to hold property for the purpose of encouraging scientific work among all classes of the community, and so assist in developing the resources of the State.

The Council emphatically endorses the sentiment of Mr. Samuel Dixon when proposing the motion for incorporation when he said that "it is now generally recognised that only by the cultivation of the spirit of scientific research can communities prosper at the present day."

During the past year six Fellows have been added to our numbers, whilst three have resigned and two have died. The membership now is 11 Hon. Fellows, 65 Fellows, 7 Corresponding Members, and 2 Associates.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Dr.	£	s.	d.	£	s.	d.
October 1st, 1901.						
To Balance				241	7	0
" Subscriptions—						
Royal Society	55	2	0			
Field Naturalists' Section	15	2	6			
Malacological Section	1	10	0			
				71	14	6
" Government Grant				53	7	6
" Interest				6	13	11
				£373	2	11

Cr.	£	s.	d.	£	s.	d.
By Cost of Transactions—						
Printing	68	7	10			
Illustrating	19	5	9			
Publishing	7	12	6			
				95	6	1
" Cost of Memoirs—Illustrating ...				20	6	0
" Wages—Caretaker				3	0	0
" Printing, Postage, and Stationery ...				6	18	0
" Library—Shelving				3	0	0
" Grants-in-aid—						
Field Naturalists' Section	10	0	0			
Malacological Section	1	5	0			
				11	5	0
" Advertising				1	18	0
" Exchange on Cheques				0	2	9
" Balance in Savings Bank, Oct. 1, 1902 ...				231	7	1
				£373	2	11

Audited and found correct,
J. S. LLOYD, Auditor.
Adelaide, 6th October, 1902.

WALTER RUTT, Hon. Treasurer.

DONATIONS TO THE LIBRARY

FOR YEAR 1901-2.

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Presented by the respective Editors, Societies, and Governments.

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Lawrence—Kansas University, Bulletins, vol. I., Nos. 1-4, 8; vol. II., Nos. 1, 6, 7, 8.
Massachusetts—Tufts College Studies, No. 7.
New York—New York Academy of Sciences: Memoirs, vol. II., pt. 3, 1901. Annals, vol. XIII., pts. 2, 3; vol. XIV., pt. 2. Palæontological Notes, Memoirs, vol. II., pt. 3.
——— Public Library: Astor, Lennox, and Tilden Foundation, Bulletin, vol. V., Nos. 10, 11; vol. VI., Nos. 1-9.
Philadelphia—Academy of Natural Sciences, Proceedings, vol. LIII., pts. 2, 3, 1901.
——— University of Pennsylvania, Botanical Laboratory, vol. II., No. 2.
——— Zoological Society, Twenty-seventh and Thirtieth Annual Reports.
——— American Philosophical Society: Proceedings, vol. XL., Nos. 165-6-7; vol. XLI., No. 168. Transactions, vol. XX. (New Series), pt. 2.
St. Louis—Academy of Science, Transactions, vol. X., Nos. 9, 10, 11; vol. XI., Nos. 1-5.
Topeka—Kansas Academy of Science, Transactions of the Thirty-second and Thirty-third Annual Meetings.
Washington—National Academy of Sciences, Memoirs, vol. VIII. Proceedings, vol. III., pp. 371-600, and Contents and Index; vol. IV., pp. 1-454; plates IX.-XII.
——— United States Geological Survey, Twenty-first Annual Report, pts. 1, 2, 3, 4, 6, and 6 continued.
——— Department of Agriculture, North American Fauna, Nos. 20 and 21.
——— Smithsonian Institution: Annual Reports of the Board of Regents to 30th June, 1897; to 30th June, 1899; to 30th June, 1900. Eighteenth Annual Report of the Bureau of American Ethnology.
——— Proceedings of the United States Nat. Hist. Museum, vol. XXII.; Bulletin, No. 50, pt. 1; Annual Report.
——— Board of Geographical Names: Special Report (Phillipine Islands), Document No. 400 Senate Papers.

LIST OF FELLOWS, MEMBERS, &c.

NOVEMBER, 1902.

Those marked (F) were present at the first meeting when the Society was founded. Those marked (L) are Life Fellows. Those marked with an asterisk have contributed papers published in the Society's Transactions.

Any changes in the addresses should be notified to the Secretary.

Date of Election

HONORARY FELLOWS.

1893. *COSSMAN, M., Rue de Maubeuge, 95, Paris.
1897. *DAVID, T. W. EDGEWORTH, B.A., F.R.S., F.G.S., Prof. Geology Sydney University.
1888. *DENNANT, JOHN, F.G.S., F.C.S., Inspector of Schools, Camberwell, Victoria.
1876. ELLERY, R. L. J., F.R.S., F.R.A.S., Gov. Astron., the Observatory, Melbourne, Victoria.
1890. *ETHERIDGE, ROBERT, Director of the Australian Museum of N.S. Wales, Sydney.
1893. GREGORIO, MARQUIS DE, Palermo, Sicily.
1855. HULL, H. M., Hobart, Tasmania.
1892. *MAIDEN, J. H., F.L.S., F.C.S., Director Botanic Gardens, Sydney, N.S. Wales.
1898. *MEYRICK, E. T., B.A., Elmswood, Marlborough, Wilts, England.
1876. RUSSELL, H. C., B A., F.R.S., F.R.A.S., Gov. Astron., Sydney, N.S. Wales.
1894. *WILSON, J. T., M.D., Prof. of Anatomy, Sydney University.

CORRESPONDING MEMBERS.

1881. BAILEY, F. M., F.L.S., Colonial Botanist, Brisbane, Queensland.
1881. *CLOUD, T. C, F.C.S., Manager Wallaroo Smelting Works, S.A.
1880. *FOELSCHE, PAUL, Inspector of Police, Palmerston, N.T.
1893. *MCKILLOP, REV. DAVID, Daly River Mission, N.T., Australia.
1886. NICOLAY. REV. C. G., Fremantle, W.A.
1883. *STIRLING, JAMES, Gov. Geologist, Victoria.
1893. *STRETTON, W. G., Palmerston, N.T., Australia.

FELLOWS.

1874. ANGAS, J. H., Adelaide, S.A.
1895. *ASHBY, EDWIN, Adelaide, S.A.
1902. BAKER, W. H., Parkside, S.A.
1893. *BEDNALL, W. T., Adelaide, S.A.
1887. *BLACKBURN, REV. THOMAS, B.A., Woodville, S.A.
1901. BOAS, ISAAC HERBERT, B.Sc., the University, Adelaide, S.A.
1886. *BRAGG, W. H., M.A., Prof. of Mathematics, University of Adelaide, S.A.
1883. *BROWN, H. Y. L., F.G.S., Gov. Geologist, S.A.
1882. BROWNE, L. G., Adelaide, S.A.

1899. BROWNE, T. L., Adelaide, S.A.
1898. BROWNE, J. HARRIS, Adelaide, S.A.
1893. BRUMMITT, ROBERT, M.R.C.S. Gilberton.
1879. CLELAND, W. L., M.B., Ch.M., J.P., Colonial Surgeon, Resident Medical Officer Parkside Lunatic Asylum, Lecturer in Materia Medica, University of Adelaide, S.A.
1895. CLELAND, JOHNB., M.D., Ch.B., Pathologist Prince Alfred's Hospital, Sydney, N.S.W.
1876. (L) COOKE, EBENEZER, Commissioner of Audit, Adelaide, S.A.
1895. COOKE, JOHN H., Adelaide, S.A.
1902. CUMMINS, R. H. LAB., St. Peter's College, Adelaide, S.A.
1887. *DIXON, SAMUEL, Adelaide, S.A.
1896. DRUMMOND, J. H. G., M.D., Pangarinda, Semaphore, S.A.
1893. DUDLEY, URIAH, White Rock S.M., Drake, N.S.W.
1890. *EAST, J. J., F.G.S., Perth, W.A.
1902. EDQUIST, A. G., Hindmarsh, S.A.
1899. FERGUSSON, ANDREW, Agricultural School, Adelaide, S.A.
1886. FLEMING, DAVID, Adelaide, S.A.
1889. FRASER, J. C., Adelaide, S.A.
1880. *GOYDER, GEORGE, F.C.S., Analyst and Assayer, Adelaide, S.A.
1896. GREENWAY, THOMAS J., Chillagoe, Queensland.
1896 HAWKER, E. W., F.G.S, Adelaide.
1896. *HIGGIN, A. J., Assistant Lecturer on Chemistry, the University, Adelaide, S.A.
1891. *HOLTZE, MAURICE, F.L.S., Director Botanic Gardens, Adelaide, S.A.
1883. *HOWCHIN, WALTER, F.G.S., Lecturer on Geology and Palæontology, the University, Adelaide, S.A.
1901. HASLAM, J. A., B.Sc., Registrar of the School of Mines and Industries, Adelaide, S.A.
1893. JAMES, THOMAS, M.R.C.S., Moonta, S.A.
1900. *JOHNCOCK, CHAS. F., Morphett Vale, S.A.
1902. ILIFFE, JAMES DRINKWATER, B.Sc., Prince Alfred College, Adelaide, S.A.
1902. JEFFREYS, G., Lecturer on Wool Sorting, School of Mines, Adelaide, S.A.
1899. KLEEMAN, RICHARD, Adelaide, S.A.
1898. *KOCH, MAX, Adelaide, S.A.
1884. LENDON, A. A., M.D. Lond., M.R.C.S., Lecturer on Forensic Medicine and on Chemical Medicine, the University, and Honorary Physician Children's Hospital, Adelaide, S.A.
1856. *LLOYD, J. S., Adelaide, S.A.
1897. LEA, A. M., Gov. Entomologist, Hobart, Tasmania.
1888. *LOWER, OSWALD, F. Ent. S. Lond., Broken Hill, N.S.W.
1874. MAYO, GEORGE G., C.E., Adelaide, S.A.
1897. *MORGAN, A. M., M.B., Ch.B., Adelaide, S.A.
1884. MUNTON, H. S., Adelaide, S.A.
1859. (L) MURRAY, DAVID, Adelaide, S.A.
1883. PHILLIPPS, W. H., Adelaide, S.A.
1886. POOLE, W. B., Adelaide, S.A.
1892. *PRIESTLEY, P. H., Parkside, S.A.
1885. *RENNIE, EDWARD H., M.A., D.Sc. London, F.C.S., Professor of Chemistry University of Adelaide, S.A.
1869. *RUTT, WALTER, Chief Assistant Engineer, Adelaide, S.A.
1891. SELWAY, W. H., Adelaide, S.A.
1893. SIMSON, AUGUSTUS, Launceston, Tasmania.
1857. *SMEATON, THOS. D., Blakiston, S.A.
1900. SMEATON, STIRLING, B.A., C.E., Adelaide, S.A.

1871. SMITH, ROBERT BARR, Adelaide, S.A.
1881. *STIRLING, EDWARD C., C.M.G., M.A., M.D., F.R.S., F.R.C.S., Professor of Physiology University of Adelaide; Director South Australian Museum, Adelaide, S.A.
1886. *TEPPER, J.G.O., F.L.S., Entomologist South Australian Museum Adelaide, S.A.
1897. *TORR, W.G., LL.D., M.A., B.C.L., Way College, Adelaide, S.A.
1894. *TURNER, A. JEFFERIS, M.D., Brisbane, Q.
1889. VARDON, HON. JOSEPH, M.L.C., J.P., Adelaide, S.A.
1878. *VERCO, JOSEPH C., M.D., F.R.C.S., Lecturer on the Principles and Practice of Medicine and Therapeutics University of Adelaide, S.A.
1902. VANDENBERGH, W. J., Barrister and Solicitor, J.P., Adelaide, S.A.
1883. WAINWRIGHT, E. H., B.Sc. London, St. Peter's College, Adelaide, S.A.
1878. WARE, W. L., J.P., Adelaide, S.A.
1859. WAY, RT. HON. SIR SAMUEL JAMES, Bart., D.C.L., Chief Justice and Lieutenant-Governor of South Australia, Adelaide, S.A.
1901. WILLIAMS, H. GILL, L.D.S., Adelaide, S.A.
1902. WOOLNOUGH, WALTER GEORGE, B.Sc., F.G.S., Lecturer on Mineralogy and Petrology the University, Adelaide, S.A.
1886. *ZIETZ, A. H. C., F.L.S., C.M.Z.S., Assistant Director South Australian Museum, Adelaide, S.A.

ASSOCIATES.

1901. *BASEDOW, HERBERT, Adelaide, S.A.
1901. COLLISON, EDITH, B.Sc., Adelaide, S.A.

RULES

OF THE

Royal Society of South Australia

(INCORPORATED).

NAME.

1. The title of the Society is the "Royal Society of South Australia (Incorporated)."

OBJECTS.

2. The objects of the Society are the promotion and diffusion of science by meetings for the reading and discussion of papers and other methods.

CONSTITUTION.

3. The Society shall be constituted of the persons whose names have been duly enrolled as members, and who have not ceased to be members.

4. His Excellency the Governor of South Australia for the time being shall be requested to be the Patron of the Society.

5. Members shall be classed as Fellows, Honorary Members, Corresponding Members and Associates.

MANAGEMENT.

6. The general management of the affairs of the Society, together with the custody of its property, shall be vested in a Council of eleven Fellows, comprising a President, two Vice-Presidents, a Treasurer, a Secretary, and six other Fellows to be elected as hereinafter provided.

7. The exercise of any power vested in the Council may be controlled by the Society in general meeting.

8. Four members of the Council shall form a quorum, and may transact any business which the Council is authorised to transact.

9. In addition to any other powers hereby conferred upon them the Council shall—

Convene all meetings of the Society and determine what papers are to be read, and generally what business is to be transacted at such meetings:

Determine as to the publication in whole or in part of any paper so read:

Elect a member of Council to represent the Society on the Board of Governors of the South Australian Public Library, Museum, and Art Gallery of South Australia:

Receive the revenues and other moneys of the Society, and apply the same in furtherance of its objects, or as may be specially directed by the Society:

Provide for the safe custody of the seal, the original papers, and all other property of the Society:

Enter into and execute all contracts and engagements of the Society:

Prepare the annual report and balance-sheet:

Regulate the meetings of the Council as a majority thereof shall determine.

Members.

10. Members may be elected as hereinafter provided.

11. Fellows and Associates shall pay such subscriptions as may be prescribed.

12. Persons distinguished for their attainments in science may be elected as Honorary Members.

13. Persons who ordinarily reside more than ten miles from Adelaide, and who, by furnishing papers, or otherwise, have, in the opinion of the Council, promoted the objects of the Society, may be elected Corresponding Members.

14. Honorary Members and Corresponding Members shall not be liable for subscriptions.

15. Young men of not more than twenty-one years of age and ladies may be Associates.

Election of Members.

16. Every candidate for membership must be nominated in the prescribed form by two Fellows.

17. The nomination paper shall be lodged with the Secretary with the prescribed subscription (if any), and shall be submitted to the Council and the Society at their first following meetings, and the election shall be held at the next subsequent meeting not being a special meeting of the Society.

18. No person shall be eligible for election as an Honorary or Corresponding Member unless recommended by the Council.

19. Elections shall be by ballot, one negative in six excluding.

20. A candidate who has been so excluded shall not be eligible to be again nominated within one year of such exclusion.

21. An Associate shall be entitled to be enrolled as a Fellow upon signing an application in due form and paying the prescribed subscription.

22. Every person admitted shall have immediate notice thereof transmitted to him by the Secretary, accompanied by a copy of the rules, and shall be enrolled as a member.

Cession of Membership.

23. A member may resign his membership at any time by notice in writing to the Secretary, and shall thereupon cease to be a member.

24. If any Fellow or Associate whose subscription shall be more than twelve months in arrear shall fail to pay the same after application in writing by the Secretary therefor, the Council may cancel his membership, and he shall thereupon cease to be a member.

Restoration.

25. The Council may upon such terms as it shall think fit re-enrol as a member any person who shall have ceased to be a member.

Election of Council.

26. At each annual meeting the President and all other officers (except the Secretary) and two of the Fellows on the Council shall retire from office, and their places shall be filled by election, which if any Fellow shall so require shall be by ballot.

27. The Fellows to retire shall be those who have been longest in office since last election, or, in case of equal tenure of office, shall be decided by lot.

28. The Secretary shall hold office during the pleasure of the Society.

29. Retiring officers and Fellows shall be eligible for re-election.

30. If a member of the Council shall without leave or some reason which the Council shall consider sufficient absent himself from three consecutive meetings of the Council he shall be deemed to have vacated his office.

31. Every casual vacancy in the Council shall be filled up at the next meeting of the Society by election by ballot.

Seal and Sealholder.

32. The Common Seal shall have the name of the Society inscribed upon it, and shall be held by the Secretary, who shall for the purposes of the Act be deemed to be the Sealholder.

The Council shall have power to use the seal in the execution of any powers hereby vested in them or otherwise in relation to the affairs or business of the Society. The seal shall never be used except by the authority of the Council. At least two members of the Council and the Secretary shall sign every instrument to which the seal is affixed.

Meetings of the Society.

33. A meeting of the Society, to be called the Annual Meeting, shall be held in the month of October in every year upon a day and at a place to be appointed by the Council.

34. At the annual meeting the Council shall submit a report and duly audited balance-sheet, and the meeting shall elect the officers and members of Council for the ensuing year and transact any other business of which due notice has been given.

35. The Council may convene an ordinary meeting of the Society at any time.

36. The Council may at any time, and shall upon the requisition in writing of seven Fellows, specifying the purpose for which the meeting is required, convene a special meeting of the Society. The special business for which the meeting has been convened, and none other, shall be transacted at such meeting.

37. A Fellow may introduce two visitors at any meeting, other than a special meeting, upon entering their names in the visitors' book. Visitors shall not speak unless invited to do so by the Chairman.

38. Honorary and Corresponding Members and Associates shall not be entitled to vote at any meeting or take part in the business of the Society.

39. Seven Fellows shall be a quorum. If at any meeting a quorum is not present within thirty minutes after the hour of meeting, the meeting shall stand adjourned to a day and time to be appointed by those present, not being earlier than seven days. At the adjourned meeting the Fellows then present may proceed to business although a quorum may not be present.

40. Three day's notice at least shall be given of every meet-

ing or adjourned meeting and of the principal items of business to be transacted thereat.

41. Notice shall be given to the members resident in South Australia by circular or in such other manner as may be prescribed.

AUDITOR.

42. Two Fellows not being members of the Council shall be chosen at some meeting of the Society prior to the annual meeting in each year to audit the accounts and balance-sheet for the then current year.

BY-LAWS.

43. The Council may make, repeal, alter, and vary by-laws for regulating the—

Subscriptions to be paid and the officers to whom they are to be paid:

Forms to be used:

Procedure at meetings:

Requisites of papers to be read at meetings:

Notice to be given of meetings:

Encouragement to be given by the Society by means of medals, prizes, or otherwise to the promotion of science:

Determine the duties of the Treasurer, Secretary, and other officers:

And generally for the better carrying out the objects and purposes of the Society.

44. No by-law or repeal, alteration, or variation of any by-law shall have any validity unless approved by a majority of the Fellows present at a meeting of the Society of which due notice has been given.

45. The Society may by a majority of at least two-thirds of the Fellows present at an annual meeting or at any special meeting duly convened for the purpose make any rule or repeal, alter, or vary any existing rule.

46. In the construction of the rules of the Society, unless the subject or context requires a different meaning:

"Prescribed" means prescribed by by-law:

Words denoting the singular number only shall be deemed to include the plural and vice versa. Words denoting the masculine gender shall be deemed to include the feminine.

47. All rules and by-laws of the Society heretofore in force are hereby repealed.

APPENDICES.

FIELD NATURALISTS' SECTION

OF THE

Royal Society of South Australia

NINETEENTH ANNUAL REPORT OF THE COMMITTEE,

FOR THE YEAR ENDED 30TH SEPTEMBER, 1902.

Evening Meetings.—During the year ten evening meetings have been held, at which papers or lectures have been read as follows:—

1901.

Oct. 15—"Snakes," Jas. Aitken.

Oct. 31—"Australian Birds and Their Habits," D. Le Souef. (Special meeting in connection with Australian Ornithological Union.)

Nov. 19—Natural History Observations: "Papirius" and "A Frosty Morning," T. D. Smeaton. "Results of Three Days' Excursion to Mount Barker," W. H. Selway, J. W. Mellor, S. Smeaton, B.A.

Dec. 20—Conversazione at Hardwicke College.

1902.

April 15—"Easter Field Club Encampment at Port Noarlunga," E. Ashby.

May 20—"Australasian Science Association Excursion to West Coast of Tasmania," Edith Collison, B.Sc.

June 17—(Paper postponed through inclement weather.)

July 15—Review of papers read at Hobart Science Meetings, S. Smeaton, B.A.

August 19—"Starfish," R. H. La B. Cummins, B.Sc.

September 16—Chairman's address: "Evolution of Plants," S. Smeaton, B.A.

There has been no definite course of study at these meetings (as in the past two years), but much interesting and

useful information has been imparted. The lecture by Mr. D. Le Souef on "Australian Birds" is worthy of special reference, as it was given at a representative gathering of various scientific societies in Adelaide to inaugurate the meetings of the Australasian Ornithologists' Union.

The members were indebted to the Misses Tilly for an enjoyable conversazione at Hardwicke College, when, besides enjoying a pleasant social function, opportunity was taken to explain the objects of the Section. In addition to botany, which always occupies a prominent position both at indoor and outdoor gatherings, such subjects as "Starfish," "Snakes," and other topics incidental to the wide scope embraced by the operations of the Section have been dealt with.

Exhibits continue to form an important item at the evening meetings. Amongst them were a collection of beautiful Humming Birds, shown by Mr. A. Zietz, F.L.S., and several interesting exhibits by Mr. J. G. O. Tepper, F.L.S. At one meeting the unusual occurrence of showing an orchid new for South Australia was recorded, viz., *Caleya major*, which was found by Mr. A. J. Wilson, at Mylor, identified by Mr. J. G. O. Tepper, F.L.S., and painted by Miss C. A. Selway. Other rare orchids are dealt with under the reference to "Excursions."

Excursions.—Thirteen excursions have been held during the year, as under:—

1901. Locality.

Oct. 12—Golden Grove.
Nov. 9-11—(Three days) Mount Barker, &c.
Nov. 23—Mount Lofty and Norton's Summit.
Dec. 21—Dredging, Port River.

1902.

April 26—Dredging, Port River.
May 17—River Sturt, from Darlington.
June 26—Mr. H. Sewell's Nurseries at Payneham.
July 19—Athelstone and Black Hill.
Aug. 16—Highbury.
Aug. 23—Miocene Beds at rear of Police Barracks; also the Zoological and Botanical Gardens.
Sep. 1—Foothills north of Teatree Gully; also Golden Grove Scrubs.
Sep. 13—Happy Valley.
Sep. 27—Upper Sturt to National Park.

The most noteworthy of these excursions was the three days' visit to Mount Barker and neighborhood. Owing to its

occurring rather late in the season, not much was done as regards our native flora, but ornithological objects were fairly well represented. As a holiday outing and social function, however, it was especially successful, thanks largely to the hospitality of residents, particularly Mr. and Mrs. R. Barr Smith, Mr. and Mrs. T. D. Smeaton, and others. Perhaps the most satisfactory excursion, botanically regarded, was that to Golden Grove on October 12, 1901, when thirteen different species of orchids were collected. Among the fresh localities visited during the year may be mentioned the trip to Norton's Summit via Mount Lofty, the foothills north of Teatree Gully, and portions of Highbury and Black Hill scrubs. Though botany has occupied the chief attention, there have been two excursions of a geological character, two dredging trips, as well as a visit to Mr. Sewell's nurseries.

Whilst there has been no absolutely new discovery to record, some flowers have been recorded for the first time at these excursions, including the orchids *Pterostylis cucullata*, from National Park, and *P. rufa* from the Torrens Gorge. In addition to names already mentioned, the Section is indebted to Mrs. and the Misses Tomkinson, of Mount Lofty, and to Mr. and Mrs. H. Sewell, of Payneham, for hospitality extended to the members.

The attendance at both the evening meetings and excursions has been well maintained.

Native Fauna and Flora Protection.—A separate report is presented from this Committee, which shows that the National Park still occupies a prominent place in its deliberations.

Death of Professor R. Tate, F.G.S., &c.—The committee have to record with deep regret the death, on September 20, 1901, of Professor Ralph Tate, F.G.S., &c., who was one of the founders of the Section, and who in its earlier years rendered invaluable aid in the promotion of its objects by his scientific attainments and by his enthusiasm for the outdoor study of Nature.

Library.—Members are reminded that there are now at their disposal a number of useful books dealing with subjects, in which it may be presumed they are interested.

Financial.—The receipts from subscriptions amount to £15 2/6, and the disbursements to £10/14/6, while the Section has returned to the Royal Society £5/2/6 more than has been received from it. It should be remembered, however, that there has been no conversazione held or Proceedings printed for the last two or three years.

Membership.—There has not been a great accession of new members during the year, but some of those elected will probably prove useful acquisitions to the Section. The number of members on the roll is 70.

S. SMEATON, Chairman.
W. H. SELWAY, Hon. Sec.

Adelaide, 16th September, 1902.

FOURTEENTH ANNUAL REPORT OF THE NATIVE FAUNA AND FLORA PROTECTION COMMITTEE OF THE FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA FOR THE YEAR ENDED SEPTEMBER 30, 1902.

During the past year the committee has not been engaged in any work of great importance.

The appearance in the "S.A. Register" of September 21, 1901, of a contributed article on the National Park, under the initials "R. O. C.," in which the writer, while professing to tell "how the reserve was secured," completely ignored the fact that this was done almost exclusively through the arduous exertions of our late Secretary, Mr. A. F. Robin and other members of this committee in obtaining the Act vesting this block of about 1,800 acres in trustees, called for the publication of a true history of the matter. The Secretary, therefore, compiled from various records a short statement of facts, showing that to our late Secretary was due most of the credit which had been lavished by "R. O. C." on another gentleman. This was published in "The Register" of October 7, 1901, a number of copies were struck off for distribution among those specially interested in the subject, and one was sent to each Commissioner of the National Park.

Before leaving this subject the committee place on record their regret that their original scheme with respect to the various bodies represented on the board was departed from. The intention was that each body should nominate a representative to be appointed by the Government, but when the Act passed, it provided for the heads of certain bodies to become ex-officio Commissioners, and the result cannot be regarded as satisfactory.

It is a matter for congratulation that the movement begun here for the preservation of the native fauna and flora has induced the taking of steps in this direction by each State of the Commonwealth, and that in at least two of them further

legislation is contemplated. So much remains to be done in some of the States that the committee hopes that so thoroughly patriotic a work as the preservation of our Australian forests and their peculiar flora, together with our unique but fast disappearing fauna, will be taken up enthusiastically by some such body as the Australian Natives' Association, and uniform legislation be secured throughout the Commonwealth before it is too late.

SAML. DIXON, Chairman.
M. SYMONDS CLARK, Hon. Sec.

Adelaide, 16th September, 1902.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF S.A.

RECEIPTS AND DISBURSEMENTS FOR THE YEAR 1901-2.

Dr. Receipts.	£	s.	d.
To Balance brought forward	6	5	11
" Subscriptions	15	2	6
" Grant from Royal Society	10	0	0
	£31	8	5

Cr. Disbursements.	£	s.	d.
By Postages and Sundries	4	9	6
" Printing	4	5	0
" Attendance	1	0	0
" Share Expenses of Mr. Le Souef's Lecture ..	1	0	0
	10	14	6
" Subscriptions as per contra paid over to Royal Society	15	2	6
" Balance in hand...	5	11	5
	£31	8	5

Audited and found correct.

J. W. BUSSELL, J. S. LLOYD, } Auditors.

W. H. SELWAY, Hon. Sec. and Treasurer.

Adelaide, 15th September, 1902.

MALACOLOGICAL SECTION

OF THE

Royal Society of South Australia

The meetings of this Section have been regularly held throughout the year. The officers have been the same as the previous year, viz., Dr. Verco, Chairman, and Edwin Ashby, Hon. Secretary. The Section has lost two of its most zealous workers during the year through death, namely, Professor Ralph Tate, F.G.S., and D. J. Adcock, Esq.

The work of revising the list of South Australian shells has been vigorously prosecuted. The classification known as Zittel's has been adopted by the Section, and the work of revision is being carried out on these lines. Thirty-five genera belonging to the class *Pelecypoda* have been dealt with during the year, including a large number of species. A great many novelties have been shown, the larger portion of them being the results of Dr. J. C. Verco's dredging trips.

EDWIN ASHBY, Hon. Secretary.

September 30, 1902.

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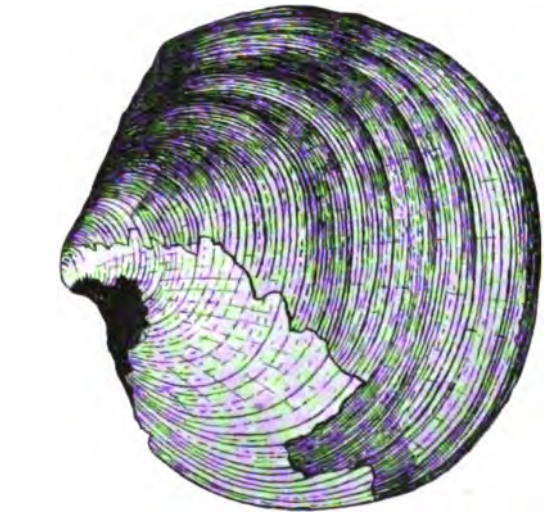
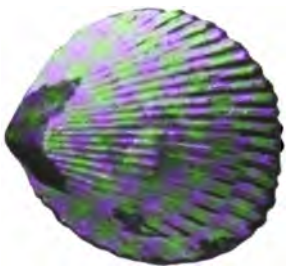
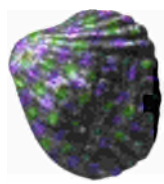


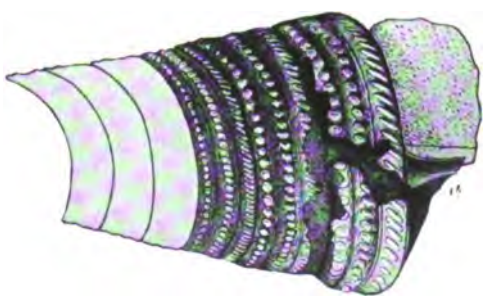
2. Meretrix Sphericula.



3. Gardium Mediosulcatum.



4. Cardita Dennanti.



1. Campanile Triseriale.

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EXPLANATION OF PLATE III.

This plate gives a front view of the larger of the two shelters mentioned in the text. Two only of the drawings are clearly visible towards the right.

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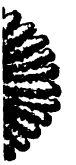
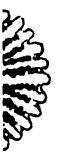
EXPLANATION OF PLATE IV.

Figures 1-9 represent drawings in the shelter represented by Plate III. Figures 10-13, in the inset at the top left hand corner, are from the smaller shelter. All the drawings on this plate are on the scale of one-sixth natural size but, for the sake of convenience in reproduction, their relative positions have not been strictly preserved.

Plate V.





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Figures 1-
Figures 10-1
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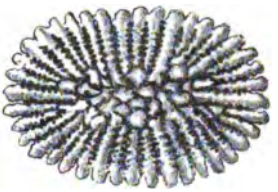
1a



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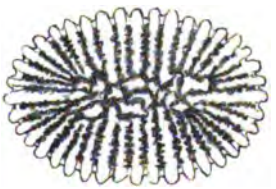

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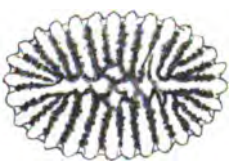
3a



3b

4a

4b

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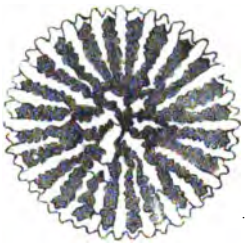
1a



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